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# Implications of Economic Growth on Poverty Levels in Putin's Russia, 2000-2008.

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**Abstract**
Devastating economic performance of the first years of Russia's transition seemed to have reversed since the beginning of Vladimir Putin's presidency. This work investigates whether the economic growth which occurred in Russia between 2000 and 2008 benefited all and the poor in particular. With the panel data from Rosstat we commence OLS, Fixed Effect and Random Effect regressions to find significant evidence that economic growth of the analysed period was pro-poor, however it was also associated with rising income inequality. Besides, we find that economic growth accounted for little variation in some other indicators of social welfare (education, housing, healthcare).

**Keywords**
Russia, Poverty, Inequality, Economic Growth

**Cover Page Footnote**
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## 1. Introduction: recession of 'nineties' vs. the boom of 'noughties'.

The first years of Post-Soviet transformation in Russia, which coincided with the presidency of Boris Yeltsin, were by most accounts, a period of economic chaos at the brink of failure which resulted in the collapse of Russian ruble in 1998[1].

According to calculations of the Economist Intelligence Unit, within seven years after the beginning of economic transition Russia lost almost 30% of its real gross domestic product (hereafter GDP), which is comparable to the decline in the economy of the United States during the Great Depression[2]. The appalling rates of consumer price inflation peaked at 2,500%[3]depreciated the savings of households and despite the fact that some preferred hard assets and foreign currency as a storage of value most Russian citizens lost their savings. The collapse of the purchasing power of ruble led to its devaluation on the 1 January 1998.

Ineffective management, breaking down of old trading connections and the eventual implementation of hard budget constraint led to a number of enterprises going bankrupt. Between 1991 and 1998 the average level of industrial production across the country fell by almost 52%[4]. Privatised enterprises effectively managed by the new class of educated entrepreneurs adapted to the market conditions by improving efficiency and cost reduction. These industrial and corporate changes resulted in the rising long-term rate of unemployment which had its peak of 25.7% in 1993[5].

The level of foreign direct investment (hereafter FDI) was one of the lowest among other economies in transition. In 1995 for instance, Russia attracted only $345million of inward FDI stocks while the outflow of capital was $20.1 billion[6]. Even though the country maintained positive trading balance since the collapse of the Soviet Union it was low (the lowest in 1997 at $19.7 billion)[7] taking into account the size of the economy and the vast amount of tradable natural resources.

Those on the lowest incomes, including pensioners, teachers and families on state benefits are always amongst the most vulnerable to economic recessions, and face the highest risk of falling into poverty trap[8]. Even though, the level of those

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[1]Desai, p.49
[2]Copper, p.2
[3]Rosstat, available at http://www.gks.ru/free_doc/new_site/prices/potr/2009/I-ipc.htm. Links to Rosstat, OECD and *all* other websites were last accessed on 22 April 2011 and none were reported to be broken as at that date.
[4]Rosstat, available at http://www.gks.ru/free_doc/new_site/business/prom/ind_prom_okved.xls
[5]OECD, available at http://dx.doi.org/10.1787/825635733410
[6]Ibid, available at http://dx.doi.org/10.1787/824532554644
[7]Ibid, available at http://dx.doi.org/10.1787/824347818584
[8]Bronson et al, p.225

who fell below the poverty line[9] dropped initially at the onset of the reforms from 33.5% in 1992 to 22.4% in 1994, it remained stagnant for the next four years and started to increase in 1998 reaching 29% in 2000. From the government's point of view, having such a large proportion of the least economically favoured people means a potential threat in the elections. It is therefore understandable why reformist Boris Yeltsin only marginally defeated the Communist Party of Russia leader Gennady Zyuganov in 1996 Presidential Election, the outcome of which had to be found out in the second round of voting[10].

On December 31st of 1999 Yeltsin stepped down as a President of Russia and the then Prime-Minister Vladimir Putin temporarily took charge as the head of the country, later becoming the legitimate President after the election in 2000[11].

Elections of the new leader of Russia at the verge of the New Millennium were associated with hope for economic stability, growth and prosperity of the people who have long enough suffered from economic volatility, financial instability following the crisis of 1998 and most importantly, uncertainty about the direction which the country was heading. The dark page of the 'nineties' was turned over and to begin a new era of economic discipline imposed by the rule of Vladimir Putinin the 'noughties'.

Indeed, the country has since demonstrated strong economic performance and delivered good results. Good enough for Russia to be considered one of the countries to 'build better global economy' along with India, China and Brazil. Consumer inflation rate dropped from 20.2% in 2000 to 13.3% in 2008[12], which was still high, but indicated a significant improvement, while the unemployment decreased from 10.6% to 6.3%[13]. The volume of international trade (measured in sum of total exports and imports) increased by a factor of 5.38 in US dollar terms[14] during the same time span[15], while most of the industries showed significant improvements in labour productivity in the same period of time[16]. These are just a few of all economic indicators that led to Russian real GDP

[9]Defined here as the share of population living on income below the minimum subsistence level set by the government of Russian Federation.
[10]Central Election Commission of Russia (hereafter CIKRF), available athttp://www.cikrf.ru/banners/vib_arhiv/president/1996/index.html
[11]CIKRF, available at http://www.cikrf.ru/banners/vib_arhiv/president/2000/index.html
[12] Rosstat, available at http://www.gks.ru/free_doc/new_site/prices/potr/2010/I-ipc.htm
[13]Ibid, available at http://www.gks.ru/free_doc/new_site/population/trud/trud6.xls
[14]Ibid, available at http://bi.gks.ru:8080/DDB/showcharts.jsp?report=voexim&project=BIPortal2.bip&width=1250
[15]Kowitt.
[16] Rosstat, available at http://www.gks.ru/free_doc/new_site/vvp/pr-tru.xls

growing at an annual average rate of almost 7%[17] between 2000 and 2008. This is a rate at which the size of the economy doubles every 10 years[18].

At first glance this creates such a strong positive impression of Russian performance, that one may be tempted to call it economic miracle. However, these impressive facts and figures do not necessary represent either the standard of living or the level of economic deprivation along with other indicators of people's welfare. Building on Jeremy Bentham's idea that the ultimate goal of economic policy should be to maximise social welfare[19], one may find it useful to judge the economic performance not just on the abstract figures indicating the quantitative level of growth, but rather on how this growth has (if) increased the quality of social well-being. This can be a rather complicated process and stretch to the point of studies on happiness economics[20], however, the most easily understandable and perhaps the most fundamental of welfare indicators is the concept of poverty, on which this work is concentrated.

The aim of this paper is to describe and assess the level of poverty *per se* along with a few other social indicators in Russia for the period between 2000 and 2008 and to understand how significant was the effect of spectacular economic performance Russia enjoyed in that period. There are several other reasons behind the specific time frame chosen for this research. First, it coincides with the Presidency of Vladimir Putin and one can evaluate social policy of 'Putin's era' using this research. Secondly, figures for 2009 may not be good indicators because of the effects of exogenous factors (global economic crisis) occurring in that year and may contribute to wrong conclusions. Finally, most of the data used comes from the Russian Federal Service of State Statistics (hereafter Rosstat) which at the time this paper is written does not have some recent necessary data.

*Section 2* of this paper will provide various definitions of poverty and approaches to its measurement. We[21] will then try to build a poverty profile in Russia by outlining findings by several scholars in *Section 3*. In *Section 4* we will attempt to find relationships between poverty, inequality and economic growth found by various scholars. Based on those results in the same section we will outline our hypotheses to be tested. *Section 5* will describe our approach to hypotheses testing, while *Section 6* will provide empirical results. We will finish with a summary of key findings followed by a brief discussion and concluding remarks in *Section 7.*

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[17]Rosstat, available at http://www.gks.ru/free_doc/new_site/vvp/tab3.xls
[18]"Rule of 72": 72/7=10 years app.
[19]Frey and Stutzer, p.2
[20]As described by Frey and Stutzer, and Easterlin
[21]Hereafter 'we' will refer to the author.

## 2. Poverty: definitions and approaches.

Poverty is often divided into relative poverty – a condition of having fewer resources than others in a society, and absolute poverty[22], which has numerous definitions by scholars from various institutions and non-governmental organizations (hereafter NGOs). World Bank, for instance, defines poverty as '...pronounced deprivation in well-being, comprising many dimensions. It includes low incomes and the inability to acquire the basic goods and services necessary for survival with dignity. Poverty also encompasses low levels of health and education, poor access to clean water and sanitation, inadequate physical security, lack of voice, and insufficient capacity and opportunity to better one's life'[23]. A definition by the United Nations encompasses the same core characteristics also adding susceptibility to violence as another feature[24], while Amartya Sen outlines the most basic capabilities essential to attaining a good enough standard of living not to be deemed 'poor': 'e.g., to meet nutritional requirements, to escape avoidable disease, to be sheltered, to be clothed, to be able to travel, and to be educated'[25].Such broad definitions leave us with difficulty and ambiguity in measuring the level of poverty.

According to Martin Ravallion[26], poverty measurement assumes the existence of pre-determined and well-defined standards of consumption – called 'poverty lines', which act as a certain threshold that must be reached in order to avoid falling under poverty qualification. These lines, therefore, represent a minimum level of 'acceptable' economic participation[27]. The composition and structure of poverty lines vary according to the economic policies of a given country. For example, poverty line in the United States is a minimum-budget estimate for food requirement multiplied by a factor of three, while poverty lines in India have traditionally been based on the estimates of expenditure necessary to acquire a minimum consumption of calories[28]. Rosstat does not provide a definition of poverty; neither does it have the official poverty measurement. What it has on the other hand, is the data for the share of people whose income falls below the minimum subsistence level (i.e. living wage). The Federal Law of Russian Federation defines minimum subsistence level as the price of the basket of consumer goods, which consists of minimum amounts of food, non-food goods and services necessary for preservation of health and survival, and additional

[22]Hereafter 'poverty' will refer to absolute poverty.
[23]World Bank, available at http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPOVERTY/0,,contentMDK:22569747~pagePK:148956~piPK:216618~theSitePK:336992,00.html
[24]Gordon, p.3
[25]Sen, p.162-163
[26]Ravallion, 'Poverty Comparisons…', p.25
[27]Ray, p.250
[28]Ibid

compulsory fees and charges[29]. Therefore, according to the definitions presented above, the use of the minimum subsistence level as the basis for poverty line is justified.

United Nations (hereafter the UN) has other additional applied methods of measuring poverty than just national poverty line. They see the proportion of people with incomes less than the minimum subsistence level as a criterion for general poverty, while the proportion of people with incomes less than 50% of the minimum subsistence level is defined as a criterion for extreme poverty[30]. The progress in achieving the UN Millennium Development Goals (hereafter MDGs) in fighting poverty is measured by the proportion of people living on less than $1[31] and $2.15[32] a day. In addition to that, proportions of undernourished families among all families with children and undernourished people in general are also among the indicators MDG progress in fighting poverty.

Foster, Greer and Thorbecke[33](hereafter FGT) derived a formula to measure the level of poverty which possesses a number of useful properties and combines information on the extent and intensity of poverty as well as the inequality among the poor. The FGT index is a popular tool in building the poverty profile since it is decomposable with population-share weights. It also allows assessing the effectiveness of government social policy by measuring, for instance, the progress made in helping groups with a high poverty risk in escaping poverty[34].

There are many other widespread methods of measuring and estimating poverty levels, each with its features and limitations, such as a Sen Index[35]. Those, however, will not be used in this paper. It is also essential to add that some of the characteristics of the poor are not accounted for many estimations and indices. Most are concerned with the actual survival requirements, such as having enough food and water, but none of those outlined above account for other essential requirements of the poor, like housing, for example. It can be argued, that poverty should not be measured and viewed just as the share of people with incomes lower than certain threshold, but rather a holistic approach should be taken. In this sense poverty can be assessed from the point of view of Maslow's hierarchy of needs, where fulfilling physiological needs is just a first step on the way out of poverty, but a complete way out of poverty also goes through realisation of safety, psychological, esteem and self-actualization needs[36]. According to the indices described above, a person, who has enough income to

[29]Rosstat, available at http://www.gks.ru/bgd/regl/b10_14p/IssWWW.exe/Stg/d01/05-31.htm
[30]National Human Development Report in the Russian Federation 2010 (hereafter UNDP), p.25
[31]US dollars converted into rubles at purchasing power parity
[32]US dollars converted into rubles at purchasing power parity
[33]Foster et al, p.763
[34]Kuznetcov and Nivorozhkina, p.233
[35]Shorrocks, pp.1225-1226
[36]Magnuson, 'Development to Fulfill Maslow's Hierarchy of Needs.'

feed himself and acquire basic goods and services, is not poor even if this person has nowhere to live or cannot get good medical treatment simply because this parameters are not accounted for in the basic poverty models. By looking at the minimum subsistence level of 7,406 rubles[37]set for Moscow in 2009 and comparing it to the housing rental rates in the same region it becomes clear, that most of the living wage would be spent on renting one of the cheapest rooms in a relatively low quality apartment[38]. Indeed, the structure of the minimum subsistence level does not include any costs of housing; neither does it include the costs of expensive medicines that many pensioners may require. Therefore, one should understand the limitations of any official estimations of poverty levels and do not treat them as the actual share of people in need. However, changes in those levels may on the other hand indicate progress made in fighting poverty.

This paper will be assessing such progress by the methods outlined above: Rosstat data on the share of people living on incomes below the minimum subsistence level, MDG implementation progress and FGT index. In addition, some housing, healthcare and education indicators will also be analysed briefly in order to try to produce the real picture of the changing well-being of Russian citizens.

**3. Russian poverty: building a profile.**

This section will provide a brief overview of poverty profile and a progress made in the fight against it in Russia as seen by different scholars using different approaches and measurement techniques outlined in the previous section.

The UN National Human Development Report 2010 (UNDP hereafter) analyses general welfare trends in Russia between 2000 and 2008 and the impact of policy measures designed to fight extreme poverty using Rosstat data. The trends of poverty indicators are presented in *Table 1*. It should be noted, however, that official statistics do not monitor extreme poverty and estimations presented in this table are based on Q3 Household Budget Survey (HBS hereafter) which excludes homeless families or people without fixed address. This leaves the most vulnerable group of population out of this dataset and, therefore, the true scale of extreme poverty phenomena in Russia are not known[39].

There is evidence of progress made in achieving MDGs outlined in *Section 2* of this work. The proportion of people living in extreme poverty on less than $1 a day (at PPP) dropped from 1.1% in 2000 to 0.04% in 2008, while the share of those living on less than $2.15 decreased from 8.3% to 1.4% in the corresponding years. However, considering that one way ticket in Moscow Underground

[37] Rosstat, available athttp://www.gks.ru/bgd/regl/b10_14p/IssWWW.exe/Stg/d01/05-10.htm
[38]Rental prices are available at http://a-realt.ru/rent_flat/orders/search/zones/0/0/30
[39]UNDP, p.29

(Metro), for example, costs about $1[4041], the adequacy of extreme poverty lines set at $2.15 and $1 a day at PPP is questionable to say the least. Therefore, one may argue that national extreme poverty line set at half of the minimum subsistence level is more applicable for indicating a more realistic extent of poverty. The share of population living on incomes falling under that line decreased by a factor of four from 16.7% in 2000 to 4.2% in 2008. This means that the extreme form of poverty was mostly eradicated in the analysed period[42].

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|
| Proportion of people living on less than, $1 a day (% of the population) | 1.1 | 0.7 | 0.2 | 0.1 | 0.3 | 0.2 | 0.1 | 0.1 | 0.04 |
| Development of the segment living on less than $1 a day, 2000=100% | 100 | 63 | 15 | 2 | 23 | 20 | 7 | 8 | 4 |
| Proportion of people living on less than $2.15 a day, (% of the population) | 8.3 | 5.6 | 3.6 | 2.7 | 2.5 | 2.1 | 1.1 | 0.4 | 1.4 |
| Development of the segment living on less than $2.15 a day, 2000=100% | 100 | 67.6 | 43.0 | 32.8 | 30.5 | 25.5 | 13.0 | 5.3 | 17.1 |
| Proportion of people with incomes less than 50% of the minimum subsistence level, (% of the population) | 16.7 | 14.0 | 11.5 | 10.1 | 9.3 | 9.7 | 6.1 | 4.2 | 4.2 |
| Development of the segment with incomes less than 50% of the minimum subsistence level, 2000=100% | 100 | 83.9 | 68.8 | 60.2 | 55.5 | 58.1 | 36.3 | 24.9 | 25.0 |

Table 1. Development of general and national indicators of extreme poverty, selective HBS data, Q3.
Source:UNDP

As was mentioned in *Section 2*, the national poverty line in Russia is set to equal the minimum subsistence level. *Figure 1* below outlines the trend in poverty reduction based on this criterion and on poverty gap basis. The share of the population with incomes below the minimum subsistence level halved between 2000 and 2008. Importantly, there is evidence of steady reduction year on year indicating there is a trend and the estimations are not erratic throughout. Poverty

[40]Moscow Underground fares are available at http://old.mosmetro.ru/pages/page_0.php?id_page=87
[41]As of 22.04.2011 $1=27.94 rubles, Central Bank of Russian Federation, available at http://www.cbr.ru/
[42]UNDP, p.30

gap, defined as the average shortfall of the total population from poverty line, narrowed from 5.0% in 2000 to 1.2% in 2008.

Overall, without getting into details of the National Poverty Reduction Strategy and certain aspects of poverty profile in Russia, the picture drawn by UNDP presents evidence of general pattern for poverty reduction in Russia.

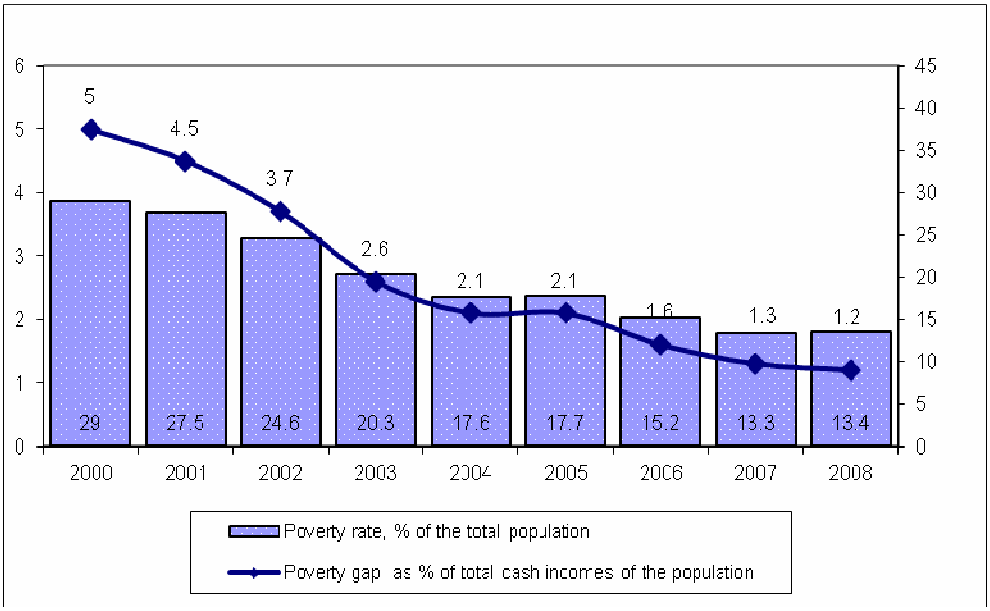


Figure 1: Poverty rate and depth in Russia in 2000-2008.
Source: UNDP

In addition to the official figures on the level and extent of poverty, Kuznetcov and Nivorozhkina[43]provide their own estimations using Russia Longitudinal Monitoring Survey (RLMS hereafter) with household being the object of their study. The period and properties they examined only partly coincide with those of our interest, but nevertheless, there are some important aspects that should be outlined.

Using FGT indices they estimate the proportion of population in poverty ($\alpha=0$) and average shortfall of per capita disposable income from the poverty line, i.e. poverty gap ($\alpha=1$). The results outlined in *Figure 2* below are significantly different from the official indicators presented for the corresponding period in *Figure 1*. They explain this difference "by the fact that the poverty line used in the analysis includes less poor individuals compared to the poverty line which is

[43]Kuznetcov and Nivorozhkina, p.233

based on the subsistence equivalent[44]". They also claim to have a wider and more consistent definition of poverty and define their poverty line at 50% of average per capita disposable income.

Interestingly, not just the actual figures (which may differ depending on the chosen measurement approaches and definitions) that are different, but also the proportionate changes as well. According to official estimates, the share of population below poverty line decreased by almost 40% between 2000 and 2005 as shown *in Figure 1*. The estimates by Kuznetcov and Nivorozhkina, however, are less optimistic and report only a 15% reduction in the corresponding period of time as seen in *Figure 2*.

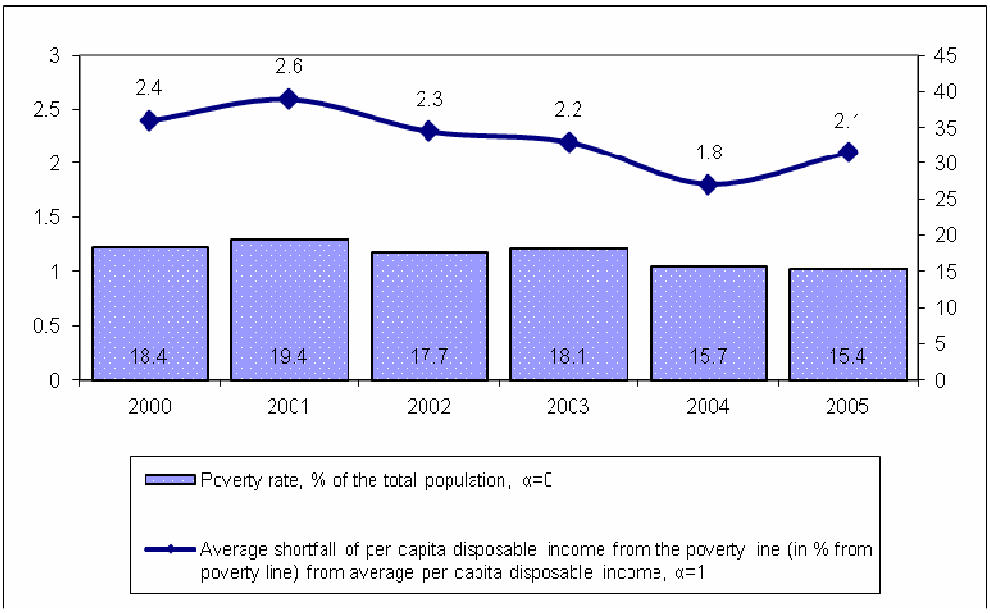


Figure 2: Poverty rate and depth in Russia in 2000-2005.
Source: Kuznetcov and Nivorozhkina

Gerry, Nivorozhkin and Rigg[45] use rounds 9-13 of RLMS for the period between 2000 and 2004. Their main measure of poverty is based on regional subsistence food basket adjusted for regional price variations. They do not provide year-on-year estimations, but report a threefold poverty level reduction from 30.5% in 2000 to 10.1% in 2004. Again, these estimates are somewhat different from all other presented above and report the higher percentage change in poverty rate of all. Their most crucial and fundamental finding for building a poverty profile in Russia, however, is the 'ruralisation' of poverty. They

[44]Ibid
[45]Gerry et al, p.595

decompose poverty rate under urban and rural to find that between 2000 and 2004 there was a 78.6% poverty reduction in urban areas and 47.3% in rural.

In general, the urban/rural divide is another type of inequality of distribution where there is a bias usually in favour of urban population. Along with inequality of income distribution to population in different income groups, the extent of this bias affects whether the poorest in some remote areas benefit from economic growth or not. If most of the economic gains occur and concentrate in the cities, the rural community will be unlikely to benefit. And although, the general level of poverty may be increasing as is reported in *Figure 1* and *Figure 2*, the share of the poor in rural areas may remain stagnant.

Distribution of wealth to population in different income groups has also been far from uniform and there is some evidence of growing income gap. *Figure 3* adapted from UNDP[46] provides an overview of differentiation of income and wages using Gini[47] and Funds[48] coefficients. Despite the observed trend of convergence in the average level of wages measured by both Gini and Funds coefficients, there has been a steady increase in the inequality level of incomes. Between 2000 and 2008 Gini index for incomes increased by 7% along with a 26% increase in the Funds coefficient.

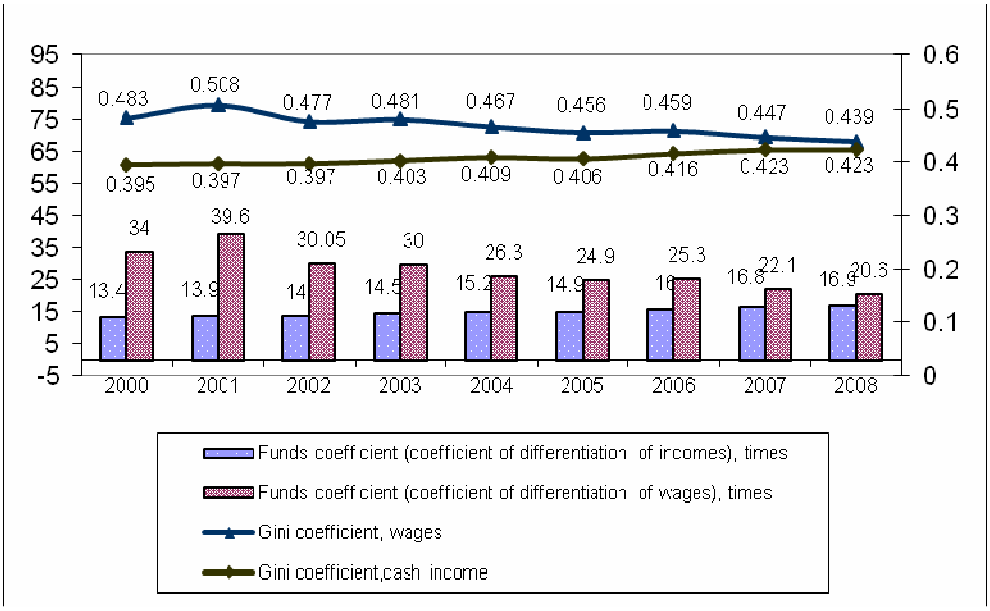


Figure 3: Differentiation of income and wages.
Source: UNDP

[46]UNDP
[47]Measure of statistical dispersion used to measure the inequality of distribution. Takes the value of 0 where distribution is uniform, and 1 where there is maximum inequality.
[48]Measure of social stratification defined as the income ratio between the highest earning decile and the lowest earning decile.

Summing up the evidence provided in this section, we can see that despite the differences in poverty definitions and approaches to its measurement, there is a consensus between the official statistics, data on extreme poverty by UNDP, FGT indices calculated by Kuznetcov and Nivorozhkina and estimations by Gerry et al, all of which show significant poverty reduction occurring since 2000, which is fundamental for our discussion. The phenomena of rising income inequality along with 'ruralisation' demonstrate important features of Russian poverty profile which must shape Russian social policy agenda.

**4. Growth and poverty: search for a relationship.**

The level of success achieved in a fight against poverty in Russia coincided with the period of strong economic performance. *Figure 4* from UNDP[49] summarises a significant progress made in raising real incomes, wages and pensions, with each of the indicators increasing more than the national GDP in between 2000 and 2009. Between 2000 and 2008 the economy grew by 60% while real cash incomes more than doubled.

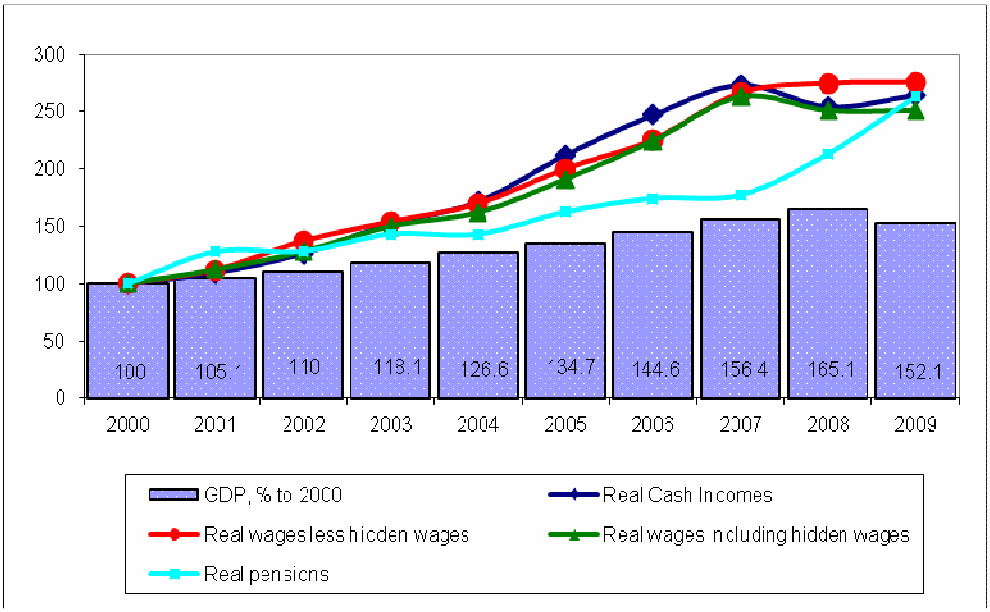


Figure 4: Progress of real average per capita cash incomes, wages and pensions, % 2000=100%
Source: UNDP

Yet, we have no grounds to claim that economic growth has been the driving force behind poverty reduction without making empirical estimations. In this section we provide an overview of literature on general connection between

[49]UNDP, p.26

poverty elimination and economic growth. The aim is to find whether economic growth benefits the poor and if there is a consensus on this issue amongst scholars and researchers. By the end of the section we will have outlined several hypotheses to be tested and explained in further sections.

Even without getting deep into methodology and terminology of poverty and growth one may simply realise that as the national income increases, the average per capita income increases proportionately. This does not, however, mean or represent the actual increase in the level of incomes of all citizens, since just a few may benefit from growth due to unequal distribution of wealth. On the other hand, those few, who benefit from such growth, may indirectly increase the wealth of others by for example increasing the consumption of domestic goods and services, which in turn will make its producers either increase their production and expenditure or employ more labour force or both. Inputting more wealth into this circular flow of income is likely to affect many participants of the economy but the number and the share of those affected are the variables that determine the level of inequality of income distribution.

Analysis of how an increase in GDP affects incomes and consumption of the most deprived helps to understand whether economic growth is good for the poor (pro-poor growth hereafter) or not (anti-poor growth hereafter[50]). Martin Ravallion[51] quotes two opposing sides of a debate on whether the poor benefit from economic growth: 'Growth really does help the poor: in fact it raises their incomes by about as much as it raises the incomes of everybody else… In short, globalization raises incomes, and the poor participate fully (The Economist, May 27, 2000, p.94)' and 'There is plenty of evidence that current patterns of growth and globalization are widening income disparities and hence acting as a brake on poverty reduction (Justin Forsyth, Oxfam Policy Director, Letter to The Economist, June 20, 2000, p.6)'.

The two conflicting opinions, however, are to some extent justified as the analysis by Ravallion proves. To test whether the poor share the growth in the average living standards he uses data sets for private consumption expenditure (PCE hereafter) per capita from the national accounts (NAS hereafter) and on the other hand, survey on average household living standards. Both approaches have their caveats and certain advantages, and do not agree in general either in the levels or in their growth rates, which again shows that much depends on the chosen definitions of poverty and methods of its measurement[52].

Ravallion finds that in both data sets there is either little or no correlation between growth in average per capita income and the change in measured

[50]The Political Economy of pro-poor growth', p.3
[51]Ravallion, 'Growth…', p.1803
[52]Ibid, p.1804

inequality. There is low correlation of -.09 between the annualized log of Gini coefficient and the annualized change in the log of the survey mean income, but it is even lower when using growth rates in consumption from NAS (0.01). This is consistent with previous evidence found by Ravallion and Chen[53] of the uncorrelated relationship between growth and inequality, and with findings by Dollar and Kraay[54], who showed that the elasticity of income of the poor (change in log mean income of the 1st Quintile[55]to the change in log GDP per capita) is close to 1 and varies slightly depending on the regression method chosen. Therefore, one can conclude that that share of the poorest quintile is uncorrelated with GDP per capita.

However, this does not imply that incomes of the poor change as much as the incomes of the rich. In proportion terms an increase in income may be equivalent across the population groups decomposed by income. In money terms, on the other hand, the gain for the poor is lower than the gain for the rich. Suppose average income in economy X changes from 1 to 2, i.e. doubles, while distribution proportions remain the same. Assume that for example the poor had 5% of total income before and they get 5% after the average income doubles. Similarly, the share of the rich remains constant at 50%. Hence, before an increase in the average income level the poor had 0.05, while the rich had 0.5. After an increase the poor get $2 \times 0.05 = 0.1$ while the rich get $2 \times 0.5 = 1$ . Therefore, rich got richer by 0.5, while the poor got richer only by 0.05.

This simplified simulation shows that given existing inequality, income gains of the rich are greater than income gains of the poor despite the distribution neutral growth. Nevertheless, given the unchanged distributional shares, the poor still gain in absolute terms: growth reduces poverty, while contraction causes its increase[56].

Proportionate changes in the $1/day poverty rate (at Purchasing Power Parity, hereafter PPP) are plotted against the proportionate changes in the survey mean income on *Figure 5*, which is constructed using data for 47 developing countries in the 1980s and 1990s[57].The regression line of the best fit passes through the origin, which means that at zero growth there is no poverty reduction. Since both axis are annualized changes in the logs, the slope of -2.50 (with standard error on 0.30 and R-squared=0.44) can be interpreted as the "growth elasticity of poverty"[58]. This implies that for every 1% increase in the average income, there is

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[53]Ravallion and Chen, p.371
[54]Dollar and Kraay, p.205
[55]Hereafter 1st Quintile will refer to the share in total income by the poorest 20% of the population, 5th Quintile – the richest.
[56]Ravallion, 'Growth…', p.1806
[57]Ibid
[58]Ibid

a 2.5% poverty reduction (as measured by the proportion of those living on below $1/day at 1993 PPP). As can further be seen from the graph, there is no evidence that elasticity depends on which way the mean moves.

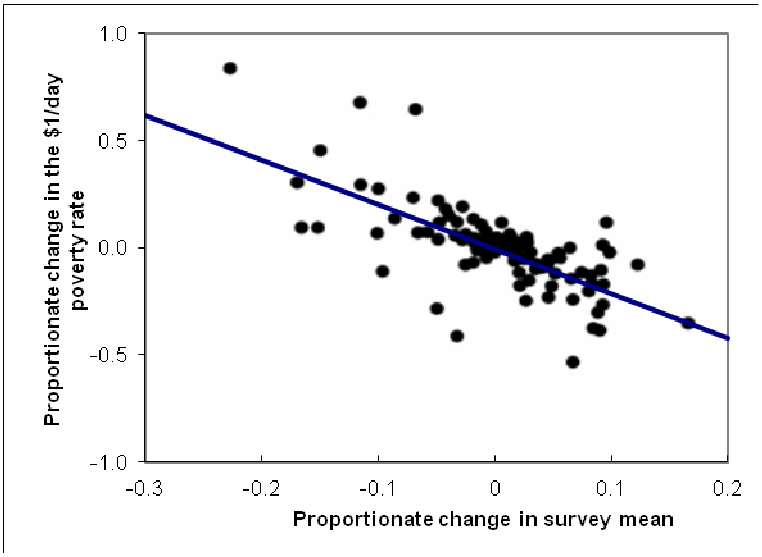


Figure 5: Poverty and mean household income.
Source: Martin Ravallion 'Growth, Inequality and Poverty: Looking Beyond Averages'

The relationship is similar using PCE per capita from NAS, although, the coefficient is weaker (-1.96) and has a higher standard error (0.89), although is statistically significant at 3%.

*Figure 6* based on World Bank's Development Indicators 2003, constructed by Hayami and Godo[59]compares FGT poverty indices and average GDP per capita for 44 countries. The upper graph plots head-count index (hereafter HCI) measured by the share of people living on below $1/day (at PPP) against the average per capita GDP, while the lower graph represents poverty gap index (hereafter PGI) measured by the sum of differences in poor people's incomes from poverty line plotted also against average GDP per capita. In both cases there is obvious negative relationship between poverty and GDP per capita with correlation coefficients of -0.85 for HCI and -0.82 for PGI.

[59]Hayami and Godo, p.205

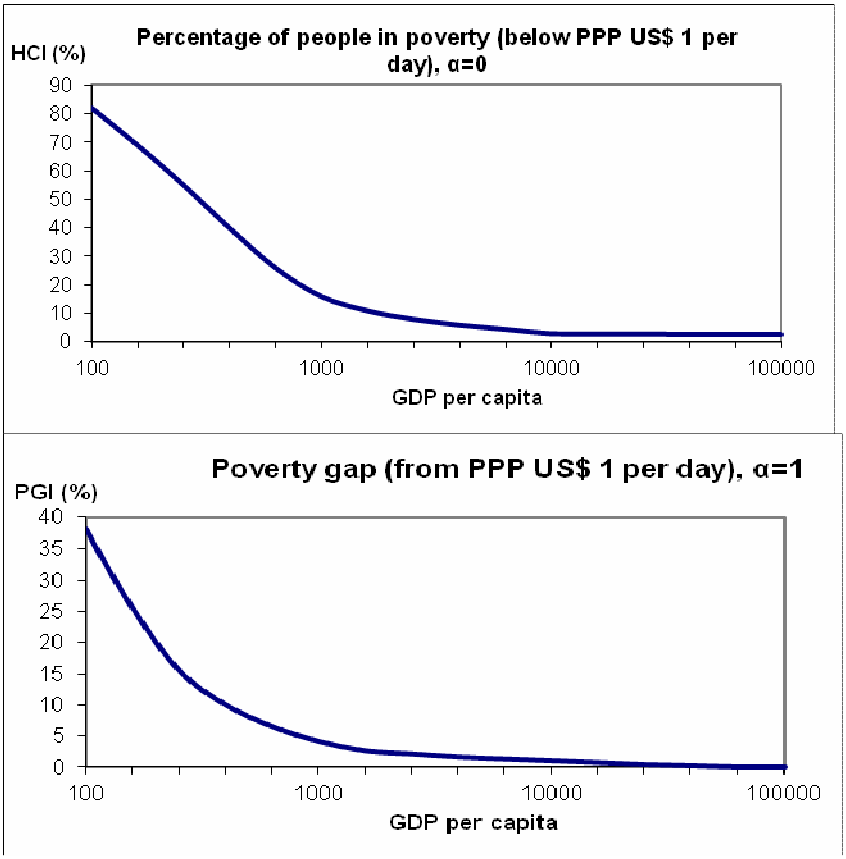


Figure 6: International comparison of absolute poverty.
Source: Yujiro Hayami and Yoshihisa Godo 'Development Economics. From the…'

Using the same datasets, Hayami and Godo ran linear regressions, where HCI and PGI were dependent variables and took logistic forms, i.e. $\ln\left(\frac{HCI}{100-HCI}\right)$ and $\ln\left(\frac{PGI}{100-PGI}\right)$, while independent variables were logs of average GDP per capita across countries.

The estimated coefficients appeared to be negative and statistically significant in both cases, indicating a decline in poverty levels following an increase in the average per capita GDP. There are caveats of this analysis, however, related, first to the static cross-country data used without adding any time dimension, and second, to a not wide enough range of values and the number of countries analysed. Nevertheless, within the data range of World Development Indicators 2003 Hayami and Godo find evidence to support their hypothesis that "prevalence of poverty among all people in society (as measured by HCI) as well as the degree of poverty among poor people (as measure by PGI) tend to decline monotonously

corresponding to increases in average GDP per capita…"[60]. They conclude that low levels of average GDP per capita is the fundamental cause of poverty, and therefore, achieving rapid economic growth is vital for developing countries with a desire of poverty reduction.

By adding regional and central planning dummies to the same regression Hayami and Godo[61] assess the effects of inequality along with average GDP per capita. Central planning dummy has negative coefficients which may be explained by the lower levels of inequality associated with this type of economic regime, while coefficients for Africa and Latin America are positive and statistically significant, potentially implying that the level of poverty is "influenced by inequality, which is determined as a part of the economic and social system formed historically through the choices of economic policies and ad hoc social and political events such as colonialism in the past[62]". So, when estimating the explanations for poverty using regressions one has to also account for factors other than average income.

In general, there is to a large extent a consensus between several contemporary scholars, like Dollar and Kraay[63], Ravallion[64], Hayami and Godo[65] amongst others who show and prove that growth is good, and even essential for poverty reduction. This does not imply, however, that growth necessarily benefits the poor as much as it benefits the rich, as it was outlined above. Neither does it mean that growth is the only factor affecting poverty levels; although, using the arguments and evidence of data presented by these scholars one can argue that growth is the fundamental one.

These findings, however, are based on aggregate cross-country empirical estimations and applying these blindly to Russia in our case and arguing that the growth experienced in the period between 2000 and 2008 must have been the driving force behind the poverty reduction would be unjustified. In order to achieve our aim of finding the effects of economic performance during the analysed period, we need to check and test several hypotheses.

The most general and perhaps the most significant is the "growth elasticity of poverty" tested by Ravallion and Chen[66] on a cross-country level. Our original hypothesis, justified by the aforementioned findings, is that growth in the average per capita GRP negatively affects poverty levels.

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[60]Ibid, p.206
[61]Ibid p.207
[62]Ibid.
[63]Dollar and Kray
[64]Ravallion, 'Growth…'
[65]Hayami and Godo
[66]Ravallion and Chen, p.369

Our second hypothesis to be tested also stems from the claim by Ravallion that there is either little or no correlation between growth in average money income and change in inequality[67]. The application of this hypothesis for Russia will be tested.

As was mentioned in *Section 2* of this paper, measuring poverty simply by a number of people or households whose incomes fall behind certain consumption threshold may be misleading in a way that it does not show the overall picture of the social well-being. In addition to the hypotheses above, it will be tested whether economic growth of 2000-2008 positively affected other social indicators like housing, education, and healthcare, since a person who is deprived of access to any of these has justifications to be deemed 'poor'.

## 5. Data and methodology.

*a. Data*

The data used for testing the outlined hypotheses and finding empirical estimations in this study comes from Rosstat publications and from their official web-site[68]. There have been recent concerns among scholars and researchers regarding the reliability of data published by Rosstat[69]. Nevertheless, this is the official statistics used for assessing the performance by government officials and policy makers and its use is justifiable, especially given no alternative regional indicators. But one has to keep in mind its limitations.

As of January 2011, the are 83 regions in the Russian Federation that include oblasts, krais, republics, autonomous okrugs and two cities of federal subordinations – Moscow and Saint-Petersburg. Most models and regressions to follow will be based on figures for all regions apart from Chechen Republic due to the unavailability of data for several years years; Kamchatka Krai/Oblast, due to the difficulty in measurements after Kamchatka Oblast merged with Koryak Autonomous Region in 2007; Zabayakalsky Krai/Chita Oblast/Agin-Buryat Autonomous Okrug, due to the same problem after the latter two merged to become the former; Khanty-Mansi Autonomous region, Yamalo-Nenets Autonomous Okrug, and Nenets Autonomous Okrug, all due to the uncalculated gross regional products (GRP) for autonomous regions because of the incommensurability of data on average constantly residing population and the

[67]Ravallion, 'Growth…', p.1805

[68]Rosstat, all data is from 'Regions of Russia. Socio-economic indicators' publications available at http://gks.ru/wps/wcm/connect/rosstat/rosstatsite/main/publishing/catalog/statisticCollections/doc_1138623506156

[69]For instance, experts from National Research University "Higher School of Economics" claim that Rosstat manipulated with data to report economic growth of 4% in 2010, Reznikova 'Eksperty somnevayutsya v dostovernosti dannyh Rosstata'.

results of economic activity performed in the region[70]. There are therefore 77 regions used in the analysis of the 2000-2008 period.

Gross regional product (hereafter GRP) per capita, income per capita and government spending are presented by Rosstat in nominal terms only; therefore they are converted into constant 2000 prices using regional consumer price index (hereafter CPI). The caveat of such approach is the excludability of price changes for certain goods and services that may have significant weight in expenditure lists of both households and governments. Nevertheless, it is the most applicable approach in our case, since it would be insensible to apply two different inflation indices for government and household as well as it would not make much sense to account for increasing housing prices, for instance, in estimating real household incomes. In any of the indices estimated hereafter 2000 is taken as the base year.

*b. Methodology.*

In order to test the first most fundamental hypothesis of this study we estimate the growth elasticity of regional poverty. We then also add regional and time binary variables to see whether there are certain regions and years where poverty explanations are significantly different from the other. In order to test for elasticity we take the logarithms of dependent and explanatory variables. The basic model party adapted from the works by Takeda[71]as follows:

$$(1)\ lnP_{it} = \alpha + \beta^{GRP} lnGRP_{it} + \mu_i + \epsilon_{it}$$

In order to try to improve the goodness of fit we gradually add some other explanatory variables as suggested by Takeda[72] to get the following:

$$(2)\ lnP_{it} = \alpha + \beta^{GRP} lnGRP_{it} + \beta^{GSP} lnGSP_{it} + \mu_i + \epsilon_{it}$$

$$(3)\ lnP_{it} = \alpha + \beta^{GRP} lnGRP_{it} + \beta^{GSP} lnGSP_{it} + Y_2E_2 \dots Y_nE_n + \epsilon_{it}$$

$$(4)\ lnP_{it} = \alpha + \beta^{GRP} lnGRP_{it} + \beta^{GSP} lnGSP_{it} + Y_2E_2 \dots Y_nE_n + \delta_2T_2 \dots \delta_nT_n + \epsilon_{it}$$

where $P_{it}$ is poverty rate in region *i* (*i*=1, …, *N*) at year t (*t*=1, …, *T*);$\alpha$ is the unknown intercept; $\beta^{GRP}$ is the growth elasticity of poverty coefficient; $GRP_{it}$ is a the real per capita GRP in region *i* (*i*=1, …, *N*) at year t (*t*=1, …, *T*); $\beta^{GSP}$ is the

[70]Rosstat, available at http://www.gks.ru/bgd/regl/b10_14p/IssWWW.exe/Stg/d01/11-02.htm
[71]Takeda, p.5
[72]Ibid

government spending elasticity of poverty coefficient; $GSP_{it}$ is the real government spending per capita in region *i* (*i*=1, …, *N*) at year t (*t*=1, …, *T*); $Y_i$ is a coefficient for the regional binary repressor $E_i$ (i=2, …, N)[73]; $\delta_t$ is a coefficient for the binary time regressor $T_t$ (*t*=2, …, *T*)[74]; $\mu_i$ is an individual unobserved effect for region *i* (*i*=1, …, *N*); $\epsilon_{it}$ is an error term in region *i* (*i*=1, …, *N*) at year t (*t*=1, …, *T*).

Apart from that, we split our data into two different periods: 2000-2004 and 2005-2008 to see whether the patterns are significantly different. For a period of 1999-2002 Takeda[75] reported a significant drop in growth elasticity of poverty[76], so we also separately estimate this indicator for 2000-2002 to check if its similar to estimations by Takeda who used a slightly different model. We also try splitting the regions into two groups: 38 with highest poverty rates and 39 with lowest poverty rates as of 2000 to see whether there are signs of convergence.

To test our second hypothesis we use Rosstat's regional Gini and Funds coefficient indicators and check for correlation between annualized changes in the logs of Gini and Funds indices and the annualized changes in the logs of average money income per capita for 2002-2008[77]. We also correlate changes in the logs of the share of total money income for different income groups (quintiles) to changes in the logs of mean income per capita for 2000-2008.We further test the relationship of changes in the log shares of incomes of each of the quintile groups and changes in the logs of Gini and Funds indices to the changes in the log mean money income per capita. The simple models as follow:

$$(5)\ lnQ^x_{it} = \alpha + \beta^{INCOME} lnINCOME_{it} + \mu_i + \epsilon_{it}$$

$$(6)\ lnGini_{it} = \alpha + \beta^{INCOME} lnINCOME_{it} + \mu_i + \epsilon_{it}$$

$$(7)\ lnFunds_{it} = \alpha + \beta^{INCOME} lnINCOME_{it} + \mu_i + \epsilon_{it}$$

where $Q^x_{it}$ is the share of income of the $x^{th}$ income quintile group (1, …, X; 1st quintile represents 20% of population with the lowest incomes, 5th quintile represents 20% of population with the highest incomes) in region *i* (*i*=1, …, *N*) at year t (*t*=1, …, *T*);$Gini_{it}$ is a Gini index for region *i* (*i*=1, …, *N*) at year t (*t*=1, …, *T*); $Funds_{it}$ is a Funds index for region *i* (*i*=1, …, *N*) at year t (*t*=1, …, *T*); $\beta^{INCOME}$ is the income elasticity coefficient; and $INCOME_{it}$ is the real income

[73]There n-1 entities since E is a binary variable
[74]There t-1 entities since T is a binary variable
[75]Takeda, p.6
[76]They obtained -0.607 for 1996-2008 and -0.192 for 1999-2002
[77]There is no Rosstat data on regional Gini and Funds indices for 2000 and 2001.

per capita accounted for CPI in region *i* (*i*=1, …, *N*) at year t (*t*=1, …, *T*).All other variable are as above (equations 1-4).

To test our final hypothesis we attempt to find the relationship between increasing GRP per capita and other social indicators. In particular, we test whether economic growth significantly affected those in need of housing. There are two housing indicators we find useful for analysis: absolute number of those registered as in need of housing and absolute number of those who used to be registered as in need of housing but acquired or improved housing in a given year in a given region. Considering that government usually plays a pivotal role in provision of social housing and other essential public goods we again add mean government spending per capita to our estimations as another explanatory variable.

We then test whether economic growth and government spending led to increasing numbers of students in professional and higher education per 10,000 of population. This stems from a logical assumption that as the productivity in the economy increases, the demand for highly-skilled labour is also likely to increase. And also, if some part of the increasing real government spending is devoted to promotion and development of higher and professional education the numbers of students should be on the rise.

Our last indicator of changes in social welfare is healthcare provision and its relationship with growth in real per capita GRP and government spending. Given ambiguity in measuring the quantity and quality of healthcare services, we only pick the most crucial variables, such as the number of hospital beds and doctors per 10,000 people to measure 'quantity'; and the number of sicknesses[78] per 10,000 people to measure 'quality' in healthcare provision[79].

To test this hypothesis we use similar approaches as described in the beginning of this section (equation 2). Most models have certain caveats and are not unconditionally reliable in estimating the exact numerical relationships and they are not supposed to be. Therefore, the models presented in this study do not claim to find perfectly accurate empirical estimations, but rather analyse the general trend and the significance of certain factors and effects.

[78]Number of sicknesses here reflects a number of people per 10,000 diagnosed with a new disease.
[79]These are simplified methods of measuring 'quantity' and 'quality' of healthcare provision, but given a different field of this study we are not going into details of proper indicators found in papers specifically devoted to the problem.

## 6. Empirical results.

*Hypothesis 1: Growth is good for the poor.*

Full details of our estimations using ordinary least squares (hereafter OLS), fixed effect (hereafter FE) and random effect (hereafter RE) are presented in *Tables 2A-23A*[80] of the Appendix section. We do not aim do provide an exact and most appropriate estimation result and will not therefore test which of the three estimations best fits the data, but we shall rather outline the trends and discuss hypothetical limitations of our models.

We start with our first and most fundamental hypothesis and test whether economic growth of 2000-2008 has been of benefit for the poor of Russia. We find three different statistically significant estimations of growth elasticity of poverty for our first model (equation 1). The pooled OLS estimation and a two-way scatter diagram on *Figure 7* below represent the least optimistic results of the three estimations but still report a relatively high coefficient of -0.5195 (R-square = 0.5252). This means that across 77 regions in a given time period for every 1% increase in the average GRP per capita there has been a 0.5195% decrease in poverty level. Using FE and RE models we find these coefficients to be -1.1088 and -0.9744 (same overall R-squared = 0.5259) respectively all significant at 1% significance level. Full details can be found in *Table 2A*.

[80] "A" in the end of the Table number means the table is found in the Appendix section.

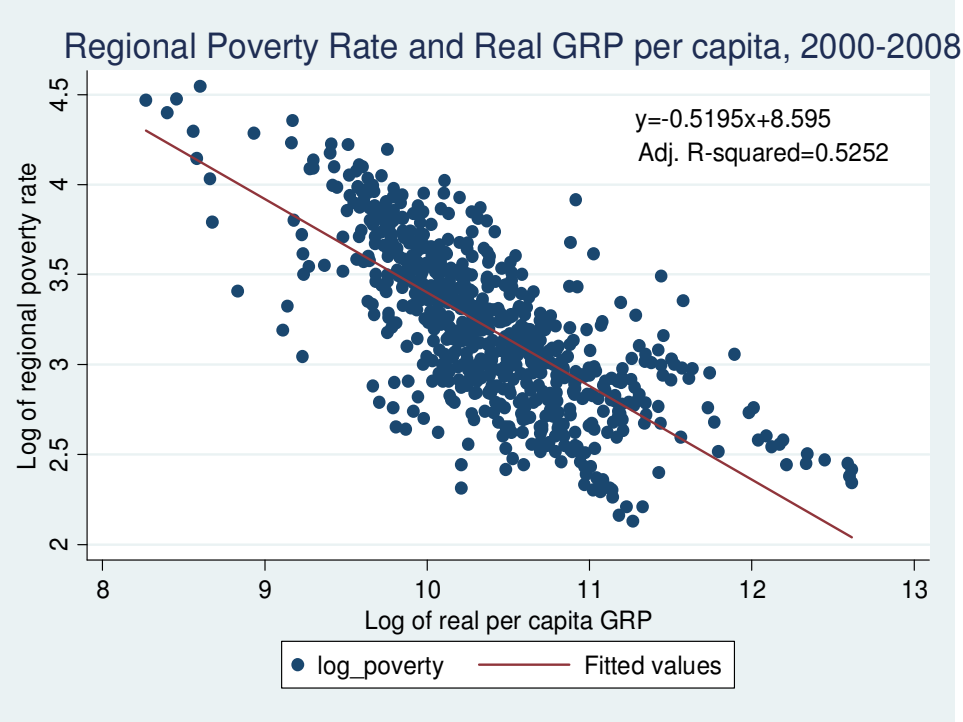


Figure 7: Regional poverty rate and real GRP per capita, 2000-2008.
Source: Author's estimations.

We then add average real (nominal accounted for CPI inflation) government spending to our models to improve the goodness of fit as suggested by Takeda[81], that does not however change either the results or the goodness of fit radically. The results are outlined in *Table 3A*. For OLS, FE and RE we get statistically significant at 1% level growth elasticity of poverty coefficients of -0.5717 (R-squared = 0.5307), -1.0448 (overall R-squared = 0.5200) and -0.8753 (overall R-squared = 0.5168) respectively. With regard to government spending elasticity of poverty the results are as follows: 0.0711 for OLS, -0.0606 for FE and -0.0745 for RE. Interestingly, the OLS estimation has a positive coefficient, while for the other two it is negative. But there is no reason to assume that increasing government expenditure can also contribute to increase in poverty.

We then split our time frame into two periods - 2000-2004 and 2005-2008 (*Tables 4A and 5A*), to check which has been more 'productive' in poverty reduction. Findings show that during the earlier period positive changes in average GRP per capita and, more importantly in this case, positive changes in average per capita government spending have been more pro-poor than in the later period. In particular, using OLS we find -0.5274 (R-squared = 0.5384) for 2000-

[81]Takeda, p.5

2004 and -0.5063 (R-squared = 0.4420) for 2004-2008; -1.0429 (overall R-squared = 0.4838) and -0.7517 (overall R-squared = 0.3843) using FE; -0.7033 (overall R-squared = 0.4881) and -0.5750 (overall R-squared = 0.3827) using RE, all in favour of the earlier period. There are two interesting features of these estimations: first, the goodness of fit as measured by R-squared is much lower for the later period, and second, the coefficients for government spending are either insignificant or less significant when using FE and RE models for 2005-2008. In theory this could mean a switch of social policies away from direct welfare support. With OLS estimations, government spending elasticity of poverty has positive values for both periods, so we disregard it, since it is not realistic.

*Table 6A* summarizes the results we obtained for 2000-2002 in order to compare with Takeda's[82] estimations for 1999-2002. We get different statistically significant results using our models than those obtained by Takeda. For growth elasticity of poverty we get -0.4915 (overall R-squared = 0.3648) using FE compared to -0.195 (overall R-squared = 0.34) found by Takeda; and -0.4360 using RE (overall R-squared = 0.4546) compared to Takeda's -0.336 (overall R-squared = 0.54). With regard to the effect of government spending we get -0.2968 and -0.0970 for FE and RE respectively compared to -0.322 and -0.198 found by Takeda. The difference can be explained by the exclusion of year 1999 in our estimations. With this explanation in mind we conclude that the process of poverty elimination has been more effective since 2000, and economic growth has been more pro-poor since then.

In order to finally confirm that the growth which occurred in the period between 2000 and 2008 was pro-poor we test for growth elasticity of poverty separately for regions with lowest and highest poverty rates as of 2000. List of regions belonging to the two groups can be found in *Table 1A*. Analysing the results we obtained from running this regression one can see that growth in real per capita GRP in regions with higher poverty was associated with stronger poverty reduction as measured by growth elasticity of poverty. For 38 regions which had the higher levels of poverty in 2000 we obtained the following results: -0.5358 using OLS (R-squared=0.4531), -1.2024 using FE (overall R-squared=0.4547) and with RE we got -1.0604 (overall R-squared=0.4547), all statistically significant under 1% level. Results for 39 regions with lowest level of poverty as of 2000 in the same order: -0.4158 (R-squared=0.4214), -0.4231 (overall R-squared=0.4231) and -0.8690 (overall R-squared=0.4231). This provides us with evidence that economic growth in poorer regions was associated with about a 20% higher poverty reduction rate when compared with the richer regions and there are therefore signs of convergence.

We also added regional and time dummies (equation 3 and 4) to find no uniformity across regions in their binary indicators with majority being positive. It

[82]Takeda, p.13, Table 2

may come as a surprise that regions like Republic of Ingushetia and the Republic of Dagestan usually associated with higher levels of unemployment and instability both have negative regional dummies. This can be explained by a huge drop in official poverty rates (eg. from 72.6% in 2000 to 10.1% in 2008 for Dagestan), but accuracy of these indicators is questionable. Nevertheless, details of this regression are summarized in *Table 9A*. In *Table 10A* there are also added time binary variables, values of which decrease year on year confirming a steady decline of population living below poverty line throughout the analysed period.

The results obtained and explained above, we believe, are sufficient to support our first hypothesis and so we claim that growth of average per capita GRP experienced between 2000 and 2008 negatively and significantly affected poverty levels. With support of the results obtained after splitting the tested regions into more and less poor and finding stronger effect on regions with higher poverty levels as of 2000, we further conclude that economic growth associated with the aforementioned period was pro-poor. One, however, has to keep in mind limitations of the official definition of national poverty line.

*Hypothesis 2: Growth does not affect inequality.*

Here we test relationships between growth in money income and inequality, which were found to be uncorrelated by Dollar and Kraay[83] and Ravallion[84]. We first check for relationships between average real income per capita[85] and income shares of each of the quintile groups from poorest to richest. *Table 2* represents a correlation matrix between the outlined variables.

| | Real GRP per capita | 1st Quintile (poorest) | 2nd Quintile | 3rd Quintile | 4th Quintile | 5th Quintile (richest) |
|---|---|---|---|---|---|---|
| **Real GRP per capita** | 1.0000 | | | | | |
| **1st Quintile (poorest)** | -0.6918 | 1.0000 | | | | |
| **2nd Quintile** | -0.6644 | 0.9883 | 1.0000 | | | |
| **3rd Quintile** | -0.6283 | 0.9648 | 0.9917 | 1.0000 | | |
| **4th Quintile** | -0.4843 | 0.8120 | 0.8785 | 0.9279 | 1.0000 | |
| **5th Quintile (richest)** | 0.6943 | -0.9977 | -0.9815 | -0.9542 | -0.7915 | 1.0000 |

Table 2: Correlation matrix between real GRP per capita and income shares of population quintiles.
Source: Author's estimations

[83]Dollar and Kraay, p.221
[84]Ravallion, 'Growth…', p.1805
[85]Hereafter "income" will mean average income per capita accounted for CPI

Contrary to the observations by Ravallion and Dollar and Kraay we find strong correlation between income and inequality. In particular, as can be seen from the above correlation matrix, growth in income levels is associated with decreasing income shares of each of the quintile groups apart from the richest. It can also be seen that correlation increases with each quintile implying that the poor are the least to benefit from the rising average income levels. This does not contradict our previous finding of economic growth causing a decline in poverty levels, but it rather shows that despite the poor getting more in real terms, their share falls as the "pie" gets bigger.

We also checked for relationship between income and official figures on Gini and Funds coefficients for 2002-2008 and found strong positive correlation of 0.7073 between Gini index and income; and of 0.7091 between income and Funds index. This illustrates that rising income levels are associated with rising inequality in Russia.

Regression analysis of increasing average income on income shares of each of the population quintiles (equation 5) yielded interesting results summarised in *Tables 11A-15A*. There is evidence of significant positive relationship between income growth and inequality measured by income shares of each of the quintile groups. In order for distribution of economic gains to be uniform, the coefficients have to be close to zero, which is not the result of our analysis. We find that only the richest 20% of the population increase their share in total average income, while all other group lose, with the poorest 20% losing the most. It can also be seen that apart from the 1st quintile having the lowest elasticity of income share coefficient, the model has one of the highest goodness of fit indicators with OLS, FE or RE R-squared being 0.4778 (adjusted), 0.4785 (overall) and 0.4785 (overall) respectively. In terms of R-squared it only loses to the 5th Quintile, which means that the proportions of variability accounted for in the dataset are the highest for the richest quintile followed by the poorest quintile. These are worrying signs indicating economic divergence.

*Tables 16A* and *17A* outline regression results of income on Gini and Funds indices for 2002-2008. We estimate all regression coefficients to be positive and significant under 1% level for each model. We find that for every 1% increase in income there is 0.4001% (adjusted R-squared=0.5035), 0.3925% (overall R-squared=0.5044) and 0.3929% (overall R-squared=0.5044) increase in Funds coefficient when applying OLS, FE and RE models respectively. So, effectively about a 2.5% increase in GRP leads to a 1% increase in the Funds coefficient and since it represents an average income ratio of the highest earning decile to the lowest earning decile, i.e. $\frac{Average\ Income\ of\ the\ Highest\ Earning\ Decile}{Average\ Income\ of\ the\ Lowest\ Earning\ Decile} = Funds\ Coefficient$, the obtained results ultimately mean that either the highest earners increase their average income by 1% while income of the lowest earners remains the same; or it is the

lowest earners who have their income reduced by 0.9% *ceteris paribus* for every 2.5% increase in average income. In any case, this shows that lowest earners lose relative to the highest earners. As for the Gini coefficient, it increases by 1% for about every 6.6% increase in income as we estimate regression coefficients for OLS, FE and RE to be 0.1470 (adjusted R-squared=0.4994), 0.1545 (overall R-squared=0.5003) and 0.1538 (overall R-squared=0.5003) respectively. Gini and Funds indices are highly correlated with a coefficient of 0.9772.

We find enough evidence to reject our original hypothesis and state that as the average incomes rises, inequality in Russia increases. This contrasts with some findings outlined in *Section 4.*Ravallion and Chen[86] did find positive relationship between inequality and growth in income levels in Eastern Europe, however the effect was estimated to be insignificant.

*Hypothesis 3: Growth is associated with improvements in other social well-being indicators -education, housing and healthcare.*

As the economy increases in size, the demand for skilled labour is also likely to increase. Rosstat data supports this claim with data on increasing number of students across regions. However whether growth *per se* is the reason behind the increasing education enrolment numbers is not clear. Our estimate of correlation between log of annualised average GRP per capita and log of number of students in higher and professional education is 0.3673. However, regression analysis does not provide strong evidence of economic growth significantly affecting education. Despite the coefficients of 0.2042 using OLS, 0.0524 using FE and of 0.0522 using RE all being significant under 1%, the models are weak due to low goodness of fit as measured by R-squared. The results are outlined in *Table 18A*.

We faced the same problem when conducted a regression of average GRP per capita and government spending on the annual number of people who acquired housing and improved housing conditions; and on the number of people registered as in need of housing. We found no significant evidence of either GRP or government spending positively affecting housing conditions across Russian regions between 2000 and 2008. Despite some coefficients being strong and significant we cannot use them for explanations due to their low goodness of fit. Nevertheless, estimations are listed in *Tables 19A* and *20A*.

Testing for relationship between GRP and improvements in "quantity" and "quality" of healthcare did not yield trustworthy results either. There is evidence of falling number of hospital beds per 10,000 people, however, despite having strong and significant coefficients, economic growth and government spending account for more than 7% of variation as seen in *Table 21A*. We had better goodness of fit when regressed GRP and government spending indicators on

[86]Ravallion and Chen, 371.

number of doctors per 10,000 people with overall and adjusted R-squared of about 0.18 when using OLS, FE and RE models but found low coefficients of 0.1614, 0.0702 and 0.0714, all listed in *Table 22A*. Economic growth and government spending also fail to explain the rising number of diagnosed new diseases per 10,000 due to the lack of evidence as summarised in *Table 23A*. However, increasing sickness level *per se* and its positive correlations of 0.4231 with average GRP per capita and of 0.3198 with real government spending per capita should be a worrying indicator for Russian policy makers.

Therefore, despite these social indicators changing both ways, there is not enough evidence that either economic growth or increasing government spending in Russia between 2000 and 2008 were the forces behind these changes.

## 7. Concluding remarks.

Summing up the above said, there are three important findings of our analysis:
a) Growth in real per capita GRP has been associated with reduction of official poverty levels across Russia throughout the period between 2000 and 2008.
b) Growth in real money incomes has been accompanied by widening inequality measured by increasing Funds and Gini coefficients, and by the rising income share of the richest quintile group of population.
c) Steadily increasing real per capita GRP and government spending have not acted as the main catalysts for changes in housing provision, professional and higher education levels as well as 'quality' and 'quantity' of healthcare.

Therefore, based on Rosstat data we can claim that poverty has been decreasing at a high rate and our calculations support the hypothesis that the growth was pro-poor. On the other hand, a big problem associated with Russian economic development was the rising level of income inequality. This phenomenon requires further analysis in order to draw policy recommendations, but we attempt to outline some hypothetical reasons.

It is essential to note the inverted-U-shape hypothesis on income distribution first pointed out by Simon Kuznets[87]. He considered initial increases in inequality levels in the early stage of development followed by their gradual reductions. There is no empirical regularity to firmly support this proposition[88] but one can speculate and suggest that during the analysed period Russia might have been at the stage of development, where inequality is on the rise and gradual reductions are to follow.

*Figure 4* previously demonstrated in *Section 3* shows high differentiation of wages, which according to UNDP contributes to overall high income differentiation and is caused by budget sector wages, the pension system and

[87]Kuznets, p.27
[88]Hayami and Godo, p.199

social support programmes growing more slowly than wages in market-driven sectors[89]. Despite the indicator decreasing, it still remains high and above overall income differentiation. Low mobility of labour between industrial sectors might impede the wage catch-up process in sectors with slower rates of development and productivity growth. Worsening obstacles to small and medium size entrepreneurship outlined in World Bank's Doing Business Report[90] 'de-incentivise' from seeking alternative sources of incomes while difficulty in getting micro-credit prevent the least privileged from economic participation.

Keeping in mind the conclusion made by Gerry et al. that poverty has become a largely rural phenomenon[91] (hence the growing income differentiation between urban and rural population), institutional development must play a pivotal role in reducing inequality. Rule of law, property protection, financial deregulation and less state intervention are the likely factors to contribute to greater equality. Applying redistribution measures, such as a move away from flat to progressive income tax system and increasing inheritance tax from 13%[92], accompanied by increases in budget sector wages might underlie equalisation in income distribution. Improvement of social insurance and social support systems along with a development of micro-credit infrastructure will facilitate economic activity among the underprivileged. Nevertheless, the problem needs further empirical investigation before making certain conclusions.

While we have not found any empirical relationship between several social indicators and economic growth mentioned in the previous section, we can still outline significant progress made in achieving greater number of higher and professional education students – an average 44% increase between 2000 and 2008[93]; and a 34% reduction in number of people registered as in need of housing. Despite a 6% increase in the number of doctors per 10,000, policy makers should worry about a 13% reduction in number of hospital beds per 10,000 accompanied by a 6% increase in a number of diagnosed illnesses.

We finally conclude that although there are clear sings of poverty levels *per se* decreasing with economic growth, evidence of improvement of social wellbeing is ambiguous. A further study on problems and causes of inequality and an in-depth analysis of social indicators are needed to draw a more complete picture of the evolving standards of living in Russia.

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[89]UNDP, p.28
[90]'Doing Business 2011', p.4
[91]Gerry et al., p.606
[92]The Tax Code of Russian Federation, Article 224.
[93]All figures in the paragraph are author's estimations based on data available from Rosstat website.

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# Appendix.

**Table 1A:** Regions with highest (left) and lowest (right) poverty rates as of 2000.

| Region | Poverty,% | Region | Poverty,% |
|---|---|---|---|
| Altai Krai | 53.9 | Arkhangelsk Oblast | 33.5 |
| Altai Republic | 59.8 | Astrakhan Oblast | 33.4 |
| Amur Oblast | 47.7 | Belgorod Oblast | 33.6 |
| Bryansk Oblast | 42.3 | Chelyabinsk Oblast | 30.7 |
| Chukotka Autonomous Okrug | 50.1 | Irkutsk Oblast | 35.5 |
| Chuvash Republic | 51.3 | Kaliningrad Oblast | 37.7 |
| Ivanovo Oblast | 68.4 | Kemerovo Oblast | 28.5 |
| Kabardino-Balkar Republic | 57.5 | Khabarovsk Krai | 35.5 |
| Kaluga Oblast | 45.5 | Komi Republic | 26.3 |
| Karachay-Cherkess Republic | 62.5 | Kostroma Oblast | 37.5 |
| Kirov Oblast | 45.2 | Krasnoyarsk Krai | 24.4 |
| Krasnodar Krai | 43.7 | Lipetsk Oblast | 30.9 |
| Kurgan Oblast | 50 | Magadan Oblast | 30.9 |
| Kursk Oblast | 42.2 | Moscow | 23.6 |
| Leningrad Oblast | 50.9 | Moscow Oblast | 35.2 |
| Mari El Republic | 60.2 | Murmansk Oblast | 24.9 |
| Novosibirsk Oblast | 52 | Nizhny Novgorod Oblast | 35.4 |
| Omsk Oblast | 44.4 | Novgorod Oblast | 34.2 |
| Orenburg Oblast | 42.1 | Perm Krai | 25.5 |
| Oryol Oblast | 41.6 | Primorsky Krai | 55.9 |
| Penza Oblast | 49.4 | Republic of Adygea | 37.2 |
| Pskov Oblast | 44.8 | Republic of Bashkortostan | 33.1 |
| Republic of Buryatia | 53.5 | Republic of Karelia | 22.3 |
| Republic of Dagestan | 72.6 | Republic of North Ossetia-Alania | 33.2 |
| Republic of Ingushetia | 94.3 | Republic of Tatarstan | 33.2 |
| Republic of Kalmykia | 66.4 | Rostov Oblast | 33.1 |
| Republic of Khakassia | 40.2 | Saint Petersburg | 27.3 |
| Republic of Mordovia | 52.9 | Sakha (Yakutia) Republic | 28.3 |
| Ryazan Oblast | 49.3 | Samara Oblast | 31.2 |
| Sakhalin Oblast | 39.6 | Smolensk Oblast | 29.8 |
| Saratov Oblast | 41.2 | Sverdlovsk Oblast | 28.8 |
| Stavropol Krai | 45.2 | Tomsk Oblast | 25.6 |
| Tambov Oblast | 45.9 | Tula Oblast | 32.2 |
| Tuva Republic | 77.9 | Tyumen Oblast | 21.3 |
| Tver Oblast | 51.5 | Udmurt Republic | 35.1 |
| Ulyanovsk Oblast | 44.5 | Volgograd Oblast | 34.9 |
| Vladimir Oblast | 44.7 | Vologda Oblast | 25.5 |
| Voronezh Oblast | 41.9 | Yaroslavl Oblast | 30.7 |

Source: Rosstat

**Table 2A**: Regression of poverty for Russia in 2000-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| Log of real GRP per capita | -0.5195 | *** | 0.0188 | -27.6900 | -1.1088 | *** | 0.2000 | -55.5600 | -0.9774 | *** | 0.0210 | -46.5400 |
| Constant | 8.5950 | *** | 0.1952 | 44.0400 | 14.7125 | *** | 0.2072 | 70.9900 | 13.3480 | *** | 0.2198 | 60.7400 |
| Number of observations | 693 | | | | 693 | | | | 693 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.5252 | | | | | | | | | | | |
| Within R-squared | | | | | 0.8339 | | | | 0.8339 | | | |
| Between R-squared | | | | | 0.5067 | | | | 0.5067 | | | |
| Overall R-squared | | | | | 0.5259 | | | | 0.5259 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.Source: Author's estimation

**Table 3A**: Regression of poverty for Russia in 2000-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| Log of real GRP per capita | -0.5717 | *** | 0.0256 | -22.3400 | -1.0448 | *** | 0.0283 | -36.9200 | -0.8753 | *** | 0.0296 | -29.5600 |
| Log of real Gov.spending per capita | 0.0711 | *** | 0.0238 | 2.9900 | -0.0606 | *** | 0.0191 | -3.1700 | -0.0745 | *** | 0.0215 | -3.4700 |
| Constant | 8.5127 | *** | 0.1966 | 43.3100 | 14.5785 | *** | 0.2107 | 69.1700 | 12.9417 | *** | 0.2232 | 57.9900 |
| Number of observations | 693 | | | | 693 | | | | 693 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.5307 | | | | | | | | | | | |
| Within R-squared | | | | | 0.8360 | | | | 0.8355 | | | |
| Between R-squared | | | | | 0.4885 | | | | 0.4794 | | | |
| Overall R-squared | | | | | 0.5200 | | | | 0.5168 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 4A**: Regression of poverty for Russia in 2000-2004

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| | - | | | - | | | | - | | | | - |
| Log of real GRP per capita | 0.5274 | *** | 0.0270 | 19.5000 | -1.0429 | *** | 0.0495 | 21.0600 | -0.7033 | *** | 0.0418 | 16.8200 |
| Log of Gov. spend. per capita | 0.1144 | *** | 0.0228 | 5.0100 | -0.1063 | *** | 0.0281 | -3.7800 | -0.0605 | ** | 0.0285 | -2.1200 |
| Constant | 7.8329 | *** | 0.2248 | 4.8500 | 14.9638 | *** | 0.4173 | 35.8600 | 11.1161 | *** | 0.3528 | 31.5000 |
| Number of observations | 381 | | | | 381 | | | | 381 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.5384 | | | | | | | | | | | |
| Within R-squared | | | | | 0.7283 | | | | 0.7280 | | | |
| Between R-squared | | | | | 0.5049 | | | | 0.5115 | | | |
| Overall R-squared | | | | | 0.4838 | | | | 0.4881 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 5A**: Regression of poverty for Russia in 2005-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| | - | | | - | | | | - | | | | - |
| Log of real GRP per capita | 0.5063 | *** | 0.0362 | 14.0000 | -0.7517 | *** | 0.0536 | 14.0100 | -0.5750 | *** | 0.0450 | 12.7900 |
| Log of Gov. spend. per capita | 0.1982 | *** | 0.0396 | 5.0100 | -0.0673 | | 0.0349 | -1.9300 | -0.0567 | * | 0.0347 | -1.6400 |
| Constant | 6.4916 | *** | 0.2844 | 22.8300 | 11.5050 | *** | 0.4298 | 26.7700 | 9.5295 | *** | 0.3598 | 26.4800 |
| Number of observations | 308 | | | | 308 | | | | 308 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.4420 | | | | | | | | | | | |
| Within R-squared | | | | | 0.6503 | | | | 0.6502 | | | |
| Between R-squared | | | | | 0.3711 | | | | 0.3691 | | | |
| Overall R-squared | | | | | 0.3843 | | | | 0.3827 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 6A**: Regression of poverty for Russia in 2000-2002

| | Pooled OLS | | | Fixed Effect (FE) | | | Random Effect (RE) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Coef. | Std.error | t-value | Coef. | Std.error | t-value | Coef. | Std.error | z-value |
| Log of real GRP per capita | 0.5055 *** | 0.0333 | 15.1600 | -0.4915 *** | 0.1018 | -4.8300 | -0.4360 *** | 0.0525 | -8.3000 |
| Log of Gov. spend. per capita | 0.1252 *** | 0.0284 | 4.4100 | -0.2968 *** | 0.0504 | -5.8800 | -0.0970 ** | 0.0374 | -2.5900 |
| Constant | 7.6152 *** | 0.2587 | 29.4300 | 11.0411 *** | 0.7758 | -5.8800 | 8.7920 *** | 0.4048 | 21.7200 |
| Number of observations | 228 | | | 228 | | | 228 | | |
| Number of groups | | | | 77 | | | 77 | | |
| Adjusted R-squared | 0.5495 | | | | | | | | |
| Within R-squared | | | | 0.5817 | | | 0.5609 | | |
| Between R-squared | | | | 0.3597 | | | 0.4652 | | |
| Overall R-squared | | | | 0.3648 | | | 0.4546 | | |
| F test (prob>F) | 0.0000 | | | 0.0000 | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | 0.0000 | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 7A**: Regression of poverty for Russia in 2000-2008 (Richest regions)

| | Pooled OLS | | | Fixed Effect (FE) | | | Random Effect (RE) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Coef. | Std.error | t-value | Coef. | Std.error | t-value | Coef. | Std.error | z-value |
| Log of real GRP per capita | 0.4158 *** | 0.0263 | 15.7900 | -1.0225 *** | 0.0257 | 39.7400 | -0.8690 *** | 0.0286 | 30.3300 |
| Constant | 7.4404 *** | 0.2811 | 26.4700 | 13.9084 *** | 0.2744 | 50.6900 | 12.2718 *** | 0.3071 | 39.9600 |
| Number of observations | 342 | | | 342 | | | 342 | | |
| Number of groups | | | | 38 | | | 38 | | |
| Adjusted R-squared | 0.4214 | | | | | | | | |
| Within R-squared | | | | 0.8390 | | | 0.8390 | | |
| Between R-squared | | | | 0.3476 | | | 0.3476 | | |
| Overall R-squared | | | | 0.4231 | | | 0.4231 | | |
| F test (prob>F) | 0.0000 | | | 0.0000 | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | 0.0000 | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 8A**: Regression of poverty for Russia in 2000-2008 (Poorest regions)

| | Pooled OLS | | | Fixed Effect (FE) | | | Random Effect (RE) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Coef. | Std.error | t-value | Coef. | Std.error | t-value | Coef. | Std.error | z-value |
| | - | | - | | | - | | | - |
| Log of real GRP per capita | 0.5358 *** | 0.0318 | 16.8400 | -1.2024 *** | 0.0300 | 40.0200 | -1.0604 *** | 0.0327 | 32.4500 |
| Constant | 8.8018 *** | 0.3220 | 27.3300 | 15.5377 *** | 0.3037 | 51.1600 | 14.1033 *** | 0.3325 | 42.4100 |
| Number of observations | 351 | | | 351 | | | 351 | | |
| Number of groups | | | | 39 | | | 39 | | |
| Adjusted R-squared | 0.4531 | | | | | | | | |
| Within R-squared | | | | 0.8409 | | | 0.8409 | | |
| Between R-squared | | | | 0.3660 | | | 0.3660 | | |
| Overall R-squared | | | | 0.4547 | | | 0.4547 | | |
| F test (prob>F) | 0.0000 | | | 0.0000 | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | 0.0000 | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 9A**: Regression of poverty for Russia in 2000-2008

| | Pooled OLS/ Random Effect (RE) | | | |
|---|---|---|---|---|
| | Coef. | | Std.error | t-value |
| Log of real GRP per capita | -1.0448 | *** | 0.0283 | -36.9200 |
| Log of real Gov.spending per capita | -0.0606 | *** | 0.0191 | -3.1700 |
| Constant | 14.3334 | *** | 0.2079 | 68.9500 |
| | | | | |
| Region | | | | |
| Altai Republic | 0.1833 | *** | 0.0706 | 2.6000 |
| Amur Oblast | 0.6966 | *** | 0.0689 | 10.1200 |
| Arkhangelsk Oblast | 0.5595 | *** | 0.0705 | 7.9400 |
| Astrakhan Oblast | 0.0043 | | 0.0684 | 0.0600 |
| Belgorod Oblast | 0.0949 | | 0.0690 | 1.3700 |
| Bryansk Oblast | -0.2768 | *** | 0.0681 | -4.0700 |
| Chelyabinsk Oblast | 0.1537 | ** | 0.0696 | 2.2100 |
| Chukotka Autonomous Okrug | 1.4431 | *** | 0.0780 | 18.4900 |
| Chuvash Republic | 0.0086 | | 0.0681 | 0.1300 |
| Irkutsk Oblast | 0.5925 | *** | 0.0696 | 8.5100 |
| Ivanovo Oblast | 0.1606 | ** | 0.0684 | 2.3500 |
| Jewish Autonomous Oblast | 0.4169 | *** | 0.0689 | 6.0500 |
| Kabardino-Balkar Republic | -0.2888 | *** | 0.0683 | -4.2300 |
| Kaliningrad Oblast | 0.2920 | *** | 0.0688 | 4.2400 |
| Kaluga Oblast | 0.0400 | | 0.0682 | 0.5900 |
| Karachay-Cherkess Republic | -0.2432 | *** | 0.0685 | -3.5500 |
| Kemerovo Oblast | 0.0765 | | 0.0693 | 1.1000 |
| Khabarovsk Krai | 0.5270 | *** | 0.0695 | 7.5800 |
| Kirov Oblast | 0.0606 | | 0.0681 | 0.8900 |
| Komi Republic | 0.6783 | *** | 0.0719 | 9.4300 |
| Kostroma Oblast | 0.0528 | | 0.0681 | 0.7800 |
| Krasnodar Krai | 0.2829 | *** | 0.0687 | 4.1200 |
| Krasnoyarsk Krai | 0.7809 | *** | 0.0713 | 10.9600 |
| Kurgan Oblast | 0.0691 | | 0.0680 | 1.0200 |
| Kursk Oblast | -0.0122 | | 0.0685 | -0.1800 |
| Leningrad Oblast | 0.5848 | *** | 0.0711 | 8.2200 |
| Lipetsk Oblast | 0.3076 | *** | 0.0703 | 4.3800 |
| Magadan Oblast | 0.9795 | *** | 0.0729 | 13.4400 |
| Mari El Republic | 0.2224 | *** | 0.0681 | 3.2700 |
| Moscow | 1.4396 | *** | 0.0784 | 18.3700 |
| Moscow Oblast | 0.1973 | *** | 0.0691 | 2.8500 |
| Murmansk Oblast | 0.6103 | *** | 0.0707 | 8.6300 |
| Nizhny Novgorod Oblast | 0.0757 | | 0.0693 | 1.0900 |
| Novgorod Oblast | 0.3955 | *** | 0.0689 | 5.7400 |
| Novosibirsk Oblast | 0.4884 | *** | 0.0689 | 7.0800 |
| Omsk Oblast | -1.0204 | *** | 0.0690 | -14.7800 |
| Orenburg Oblast | 0.5634 | *** | 0.0700 | 8.0500 |
| Oryol Oblast | 0.1527 | ** | 0.0684 | 2.2300 |
| Penza Oblast | -0.0830 | | 0.0681 | -1.2200 |
| Perm Krai | 0.2784 | *** | 0.0832 | 3.3500 |

| | | | | |
|---|---|---|---|---|
| Primorsky Krai | 0.6523 | *** | 0.0689 | 9.4600 |
| Pskov Oblast | -0.1385 | ** | 0.0681 | -2.0300 |
| Republic of Adygea | -0.3014 | *** | 0.0689 | -4.3700 |
| Republic of Bashkortostan | 0.1322 | * | 0.0691 | 1.9100 |
| Republic of Buryatia | 0.4903 | *** | 0.0684 | 7.1700 |
| Republic of Dagestan | -0.3589 | *** | 0.0686 | -5.2300 |
| Republic of Ingushetia | -0.6284 | *** | 0.0768 | -8.1800 |
| Republic of Kalmykia | 0.2995 | *** | 0.0692 | 4.3300 |
| Republic of Karelia | 0.2370 | *** | 0.0694 | 3.4200 |
| Republic of Khakassia | 0.3413 | *** | 0.0687 | 4.9700 |
| Republic of Mordovia | 0.1030 | | 0.0686 | 1.5000 |
| Republic of North Ossetia-Alania | -0.4831 | *** | 0.0686 | -7.0400 |
| Republic of Tatarstan | 0.3109 | *** | 0.0703 | 4.4200 |
| Rostov Oblast | -0.1984 | *** | 0.0683 | -2.9100 |
| Ryazan Oblast | 0.1480 | ** | 0.0684 | 2.1600 |
| Saint Petersburg | 0.2135 | *** | 0.0756 | 2.8300 |
| Sakha (Yakutia) Republic | 1.2646 | *** | 0.0740 | 17.1000 |
| Sakhalin Oblast | 1.2520 | *** | 0.0746 | 16.7900 |
| Samara Oblast | 0.5176 | *** | 0.0716 | 7.2300 |
| Saratov Oblast | 0.2564 | *** | 0.0685 | 3.7400 |
| Smolensk Oblast | -0.1167 | * | 0.0684 | -1.7100 |
| Stavropol Krai | -0.0276 | | 0.0681 | -0.4100 |
| Sverdlovsk Oblast | 0.1140 | | 0.0698 | 1.6300 |
| Tambov Oblast | -0.2128 | *** | 0.0682 | -3.1200 |
| Tomsk Oblast | 0.4868 | *** | 0.0709 | 6.8700 |
| Tula Oblast | -0.1869 | *** | 0.0683 | -2.7300 |
| Tuva Republic | 0.2575 | *** | 0.0707 | 3.6400 |
| Tver Oblast | 0.1392 | ** | 0.0684 | 2.0400 |
| Tyumen Oblast | 1.7092 | *** | 0.0843 | 20.2900 |
| Udmurt Republic | 0.3011 | *** | 0.0688 | 4.3700 |
| Ulyanovsk Oblast | 0.0218 | | 0.0681 | 0.3200 |
| Vladimir Oblast | 0.1398 | ** | 0.0682 | 2.0500 |
| Volgograd Oblast | -0.0910 | | 0.0687 | -1.3300 |
| Vologda Oblast | 0.5462 | *** | 0.0749 | 7.2900 |
| Voronezh Oblast | 0.0132 | | 0.0682 | 0.1900 |
| Yaroslavl Oblast | 0.1399 | ** | 0.0691 | 2.0200 |
| | | | | |
| Number of observations | 693 | | | |
| Number of groups | | | | 77 |
| Adjusted R-squared | 0.8958 | | | |
| Within R-squared | | | | 0.8360 |
| Between R-squared | | | | 1.0000 |
| Overall R-squared | | | | 0.9076 |
| F test (prob>F) | 0.0000 | | | |
| Breusch & Pagan test (prob>chi2) | | | | 0.0000 |

Source: Author's estimation.

**Table 10A**: Regression of poverty for Russia in 2000-2008

| | Pooled OLS/ Random Effect (RE) | | | |
|---|---|---|---|---|
| | Coef. | | Std.error | t-value |
| Log of real GRP per capita | -0.5252 | *** | 0.0508 | -10.3300 |
| Log of real Gov.spending per capita | -0.0110 | | 0.0174 | -0.6300 |
| Constant | 9.0275 | *** | 0.4880 | 18.5000 |
| | | | | |
| Region | | | | |
| Altai Republic | 0.1978 | *** | 0.0617 | 3.2100 |
| Amur Oblast | 0.3952 | *** | 0.0652 | 6.0600 |
| Arkhangelsk Oblast | 0.0912 | | 0.0731 | 1.2500 |
| Astrakhan Oblast | -0.1643 | *** | 0.0613 | -2.6800 |
| Belgorod Oblast | -0.1754 | *** | 0.0644 | -2.7200 |
| Bryansk Oblast | -0.2381 | *** | 0.0594 | -4.0100 |
| Chelyabinsk Oblast | -0.1514 | ** | 0.0660 | -2.2900 |
| Chukotka Autonomous Okrug | 0.4713 | *** | 0.1062 | 4.4400 |
| Chuvash Republic | 0.0045 | | 0.0593 | 0.0800 |
| Irkutsk Oblast | 0.2085 | *** | 0.0689 | 3.0300 |
| Ivanovo Oblast | 0.2682 | *** | 0.0603 | 4.4500 |
| Jewish Autonomous Oblast | 0.2442 | *** | 0.0618 | 3.9500 |
| Kabardino-Balkar Republic | -0.1666 | *** | 0.0605 | -2.7600 |
| Kaliningrad Oblast | 0.0032 | | 0.0647 | 0.0500 |
| Kaluga Oblast | -0.1035 | * | 0.0607 | -1.7000 |
| Karachay-Cherkess Republic | -0.1201 | *** | 0.0607 | -1.9800 |
| Kemerovo Oblast | -0.2732 | *** | 0.0673 | -4.0600 |
| Khabarovsk Krai | 0.1169 | * | 0.0698 | 1.6800 |
| Kirov Oblast | 0.0011 | | 0.0596 | 0.0200 |
| Komi Republic | 0.0607 | | 0.0816 | 0.7400 |
| Kostroma Oblast | -0.0334 | | 0.0598 | -0.5600 |
| Krasnodar Krai | 0.0814 | | 0.0623 | 1.3100 |
| Krasnoyarsk Krai | 0.2060 | *** | 0.0789 | 2.6100 |
| Kurgan Oblast | 0.0751 | | 0.0593 | 1.2700 |
| Kursk Oblast | -0.1381 | | 0.0607 | -2.2800 |
| Leningrad Oblast | 0.2103 | *** | 0.0698 | 3.0100 |
| Lipetsk Oblast | -0.1265 | * | 0.0715 | -1.7700 |
| Magadan Oblast | 0.2510 | *** | 0.0883 | 2.8400 |
| Mari El Republic | 0.2658 | *** | 0.0595 | 4.4700 |
| Moscow | 0.3764 | *** | 0.1129 | 3.3300 |
| Moscow Oblast | -0.1380 | ** | 0.0666 | -2.0700 |
| Murmansk Oblast | 0.0744 | | 0.0765 | 0.9700 |
| Nizhny Novgorod Oblast | -0.1660 | | 0.0638 | -2.6000 |
| Novgorod Oblast | 0.0956 | | 0.0651 | 1.4700 |
| Novosibirsk Oblast | 0.2020 | *** | 0.0648 | 3.1200 |
| Omsk Oblast | -0.6938 | *** | 0.0662 | -10.4900 |
| Orenburg Oblast | 0.1967 | *** | 0.0685 | 2.8700 |
| Oryol Oblast | -0.0063 | | 0.0611 | -0.1000 |
| Penza Oblast | -0.0754 | | 0.0593 | -1.2700 |
| Perm Krai | -0.0529 | | 0.0780 | -0.6800 |

| | | | | |
|---|---|---|---|---|
| Primorsky Krai | 0.3655 | *** | 0.0648 | 5.6400 |
| Pskov Oblast | -0.2112 | *** | 0.0597 | -3.5400 |
| Republic of Adygea | -0.1038 | * | 0.0624 | -1.6600 |
| Republic of Bashkortostan | -0.1893 | * | 0.0661 | -2.8600 |
| Republic of Buryatia | 0.3023 | *** | 0.0617 | 4.9000 |
| Republic of Dagestan | -0.1805 | *** | 0.0617 | -2.9200 |
| Republic of Ingushetia | 0.0615 | | 0.0892 | 0.6900 |
| Republic of Kalmykia | 0.4122 | *** | 0.0611 | 6.7400 |
| Republic of Karelia | -0.1391 | ** | 0.0683 | -2.0400 |
| Republic of Khakassia | 0.1239 | ** | 0.0626 | 1.9800 |
| Republic of Mordovia | 0.0938 | | 0.0598 | 1.5700 |
| Republic of North Ossetia-Alania | -0.4170 | *** | 0.0601 | -6.9400 |
| Republic of Tatarstan | -0.1842 | ** | 0.0742 | -2.4800 |
| Rostov Oblast | -0.2683 | *** | 0.0598 | -4.4900 |
| Ryazan Oblast | -0.0098 | | 0.0611 | -0.1600 |
| Saint Petersburg | -0.2556 | *** | 0.0773 | -3.3100 |
| Sakha (Yakutia) Republic | 0.4326 | *** | 0.0952 | 4.5400 |
| Sakhalin Oblast | 0.4416 | *** | 0.0945 | 4.6700 |
| Samara Oblast | 0.0752 | | 0.0730 | 1.0300 |
| Saratov Oblast | 0.0913 | | 0.0613 | 1.4900 |
| Smolensk Oblast | -0.2387 | *** | 0.0605 | -3.9400 |
| Stavropol Krai | -0.0375 | | 0.0594 | -0.6300 |
| Sverdlovsk Oblast | -0.2510 | *** | 0.0683 | -3.6800 |
| Tambov Oblast | -0.2860 | *** | 0.0598 | -4.7800 |
| Tomsk Oblast | -0.0098 | | 0.0748 | -0.1300 |
| Tula Oblast | -0.3244 | *** | 0.0607 | -5.3400 |
| Tuva Republic | 0.3405 | *** | 0.0621 | 5.4800 |
| Tver Oblast | -0.0211 | | 0.0611 | -0.3500 |
| Tyumen Oblast | 0.4131 | *** | 0.1321 | 3.1300 |
| Udmurt Republic | 0.0439 | | 0.0639 | 0.6900 |
| Ulyanovsk Oblast | 0.0204 | | 0.0593 | 0.3400 |
| Vladimir Oblast | 0.0632 | | 0.0598 | 1.0600 |
| Volgograd Oblast | -0.2702 | *** | 0.0618 | -4.3700 |
| Vologda Oblast | 0.0506 | | 0.0780 | 0.6500 |
| Voronezh Oblast | -0.0600 | | 0.0598 | -1.0000 |
| Yaroslavl Oblast | -0.1762 | ** | 0.0659 | -2.6700 |
| | | | | |
| Year | | | | |
| 2001 | -0.0636 | *** | 0.0209 | -3.0400 |
| 2002 | -0.1617 | *** | 0.0221 | -7.3100 |
| 2003 | -0.2521 | *** | 0.0239 | -10.5700 |
| 2004 | -0.3114 | *** | 0.0273 | -11.4100 |
| 2005 | -0.3818 | *** | 0.0307 | -12.4500 |
| 2006 | -0.4432 | *** | 0.0362 | -12.2400 |
| 2007 | -0.4756 | *** | 0.0413 | -11.5200 |
| 2008 | -0.5120 | *** | 0.0450 | -11.3700 |
| | | | | |
| Number of observations | 693 | | | |
| Number of groups | | | | 77 |

| | | |
|---|---|---|
| Adjusted R-squared | 0.9208 | |
| Within R-squared | | 0.8770 |
| Between R-squared | | 1.0000 |
| Overall R-squared | | 0.9307 |
| F test (prob>F) | 0.0000 | |
| Breusch & Pagan test (prob>chi2) | | 0.0000 |

Source: Author's estimation.

**Table 11A**: Regression of income share of the 1st quintile, 2000-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| | - | | | | - | | | | - | | | |
| Log of real INCOME per capita | 0.2230 | *** | 0.0089 | -25.1800 | 0.2208 | *** | 0.0055 | -39.9100 | 0.2209 | *** | 0.0054 | -40.5500 |
| Constant | 3.5855 | *** | 0.0687 | 52.2100 | 3.5682 | *** | 0.0428 | 83.2900 | 3.5690 | *** | 0.0441 | 80.9600 |
| Number of observations | 693 | | | | 693 | | | | 693 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.4778 | | | | | | | | | | | |
| Within R-squared | | | | | 0.7214 | | | | 0.7214 | | | |
| Between R-squared | | | | | 0.3963 | | | | 0.3963 | | | |
| Overall R-squared | | | | | 0.4785 | | | | 0.4785 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 12A**: Regression of income share of the 2nd quintile, 2000-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| | - | | | | - | | | | - | | | |
| Log of real INCOME per capita | 0.1486 | *** | 0.0064 | -23.3700 | 0.1332 | *** | 0.0037 | -36.3900 | 0.1338 | *** | 0.0036 | -37.0000 |
| Constant | 3.5690 | *** | 0.0493 | 72.3700 | 3.4494 | *** | 0.0283 | 121.7200 | 3.4541 | *** | 0.0295 | 117.0900 |
| Number of observations | 693 | | | | 693 | | | | 693 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.4407 | | | | | | | | | | | |
| Within R-squared | | | | | 0.6828 | | | | 0.5836 | | | |
| Between R-squared | | | | | 0.3842 | | | | 0.2984 | | | |
| Overall R-squared | | | | | 0.4415 | | | | 0.3477 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 13A**: Regression of income share of the 3rd quintile, 2000-2008

| | Pooled OLS | | | Fixed Effect (FE) | | | Random Effect (RE) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Coef. | Std.error | t-value | Coef. | Std.error | t-value | Coef. | Std.error | z-value |
| | - | | | - | | | - | | |
| Log of real INCOME per capita | 0.0885 *** | 0.0042 | -21.2300 | 0.0720 *** | 0.0024 | -30.5000 | 0.0726 *** | 0.0023 | -31.0900 |
| Constant | 3.4579 *** | 0.0323 | 106.9300 | 3.3296 *** | 0.0183 | 182.2100 | 3.3346 *** | 0.0191 | 174.7500 |
| Number of observations | 693 | | | 693 | | | 693 | | |
| Number of groups | | | | 77 | | | 77 | | |
| Adjusted R-squared | 0.3939 | | | | | | | | |
| Within R-squared | | | | 0.6020 | | | 0.6020 | | |
| Between R-squared | | | | 0.3634 | | | 0.3634 | | |
| Overall R-squared | | | | 0.3948 | | | 0.3948 | | |
| F test (prob>F) | 0.0000 | | | 0.0000 | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | 0.0000 | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 14A**: Regression of income share of the 4th quintile, 2000-2008

| | Pooled OLS | | | Fixed Effect (FE) | | | Random Effect (RE) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Coef. | Std.error | t-value | Coef. | Std.error | t-value | Coef. | Std.error | z-value |
| | - | | | - | | | - | | |
| Log of real INCOME per capita | 0.0215 *** | 0.0015 | -14.5500 | 0.0100 *** | 0.0011 | -9.5100 | 0.0108 *** | 0.0010 | 0.0083 |
| Constant | 3.2967 *** | 0.0115 | 287.7600 | 3.2080 *** | 0.0082 | 392.8200 | 3.2141 *** | 0.0083 | 386.5900 |
| Number of observations | 693 | | | 693 | | | 693 | | |
| Number of groups | | | | 77 | | | 77 | | |
| Adjusted R-squared | 0.2334 | | | | | | | | |
| Within R-squared | | | | 0.1281 | | | 0.1281 | | |
| Between R-squared | | | | 0.3044 | | | 0.3044 | | |
| Overall R-squared | | | | 0.2345 | | | 0.2345 | | |
| F test (prob>F) | 0.0000 | | | 0.0000 | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | 0.0000 | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 15A**: Regression of income share of the 5th quintile, 2000-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| Log of real INCOME per capita | 0.1013 | *** | 0.0040 | 25.3600 | 0.1043 | *** | 0.0027 | 39.1900 | 0.1041 | *** | 0.0026 | 39.8200 |
| Constant | 2.9806 | *** | 0.0310 | 96.2400 | 2.9572 | *** | 0.0206 | 143.4700 | 2.9585 | *** | 0.0210 | 140.6300 |
| Number of observations | 693 | | | | 693 | | | | 693 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.4813 | | | | | | | | | | | |
| Within R-squared | | | | | 0.7140 | | | | 0.7140 | | | |
| Between R-squared | | | | | 0.3927 | | | | 0.3927 | | | |
| Overall R-squared | | | | | 0.4820 | | | | 0.4820 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 16A**: Regression of Funds coefficient, 2002-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| Log of real INCOME per capita | 0.4001 | *** | 0.0171 | 23.3800 | 0.3925 | *** | 0.0106 | 37.0000 | 0.3929 | *** | 0.0104 | 37.8600 |
| Constant | -0.6876 | *** | 0.1348 | -5.1000 | -0.6275 | *** | 0.0834 | -7.5200 | -0.6309 | *** | 0.0841 | -7.5000 |
| Number of observations | 539 | | | | 539 | | | | 539 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.5035 | | | | | | | | | | | |
| Within R-squared | | | | | 0.7481 | | | | 0.7481 | | | |
| Between R-squared | | | | | 0.4502 | | | | 0.4502 | | | |
| Overall R-squared | | | | | 0.5044 | | | | 0.5044 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation

**Table 17A**: Regression of Gini coefficient, 2002-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| Log of real INCOME per capita | 0.1470 | *** | 0.0064 | 23.0400 | 0.1545 | *** | 0.0052 | 29.4800 | 0.1538 | *** | 0.0050 | 30.5400 |
| Constant | -2.1503 | *** | 0.0503 | -42.7800 | -2.2089 | *** | 0.0412 | -53.5900 | -2.2028 | *** | 0.0402 | -54.7400 |
| Number of observations | 539 | | | | 539 | | | | 539 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.4994 | | | | | | | | | | | |
| Within R-squared | | | | | 0.6568 | | | | 0.5636 | | | |
| Between R-squared | | | | | 0.4564 | | | | 0.3804 | | | |
| Overall R-squared | | | | | 0.5003 | | | | 0.4021 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 18A**: Regression of Education (Higher and Professional Education Students per 10,000 population) for Russia in 2000-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| Log of real GRP per capita | 0.2042 | *** | 0.0240 | 8.5000 | 0.0524 | *** | 0.0149 | 3.5300 | 0.0522 | *** | 0.0147 | 3.5600 |
| Log of real Gov.spending per capita | -0.0303 | | 0.0224 | -1.3500 | 0.3132 | *** | 0.0220 | 14.2600 | 0.2970 | *** | 0.0212 | 14.0000 |
| Constant | 4.4362 | *** | 0.1846 | 24.0400 | 2.5801 | *** | 0.1635 | 15.7800 | 2.7490 | *** | 0.1611 | 17.0600 |
| Number of observations | 693 | | | | 693 | | | | 693 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.1347 | | | | | | | | | | | |
| Within R-squared | | | | | 0.4875 | | | | 0.4875 | | | |
| Between R-squared | | | | | 0.0692 | | | | 0.0687 | | | |
| Overall R-squared | | | | | 0.1291 | | | | 0.1287 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 19A**: Regression of Number of People who acquired housing or improved housing conditions for Russia in 2000-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| Log of real GRP per capita | 1.5310 | *** | 0.0798 | 19.1900 | -0.4750 | *** | 0.0776 | -6.1200 | -0.1187 | | 0.0798 | -1.4900 |
| Log of real Gov.spending per capita | -0.8189 | *** | 0.0716 | -11.4400 | -0.0853 | *** | 0.0522 | -1.6300 | -0.2150 | *** | 0.0557 | -3.8600 |
| Constant | -1.5472 | ** | 0.6027 | -2.5700 | 12.8706 | *** | 0.5770 | 22.3100 | 10.2791 | *** | 0.6008 | 17.1100 |
| Number of observations | 693 | | | | 693 | | | | 693 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.3533 | | | | | | | | | | | |
| Within R-squared | | | | | 0.1553 | | | | 0.1298 | | | |
| Between R-squared | | | | | 0.4072 | | | | 0.1710 | | | |
| Overall R-squared | | | | | 0.1871 | | | | 0.0518 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 20A**: Regression of number of people registered as in need of housing for Russia in 2000-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| Log of real GRP per capita | 0.0654 | | 0.0399 | 1.6400 | -0.5616 | *** | 0.0546 | -10.2900 | -0.3395 | *** | 0.0497 | -6.8300 |
| Log of real Gov.spending per capita | -0.1233 | *** | 0.0359 | -3.4300 | -0.0813 | ** | 0.0368 | -2.2100 | -0.1290 | *** | 0.0360 | -3.5800 |
| Constant | 2.3928 | *** | 0.3018 | 7.9300 | 8.5420 | *** | 0.4060 | 21.0400 | 6.6490 | *** | 0.3731 | 17.8200 |
| Number of observations | 693 | | | | 693 | | | | 693 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.0156 | | | | | | | | | | | |
| Within R-squared | | | | | 0.3254 | | | | 0.3186 | | | |
| Between R-squared | | | | | 0.0420 | | | | 0.0391 | | | |
| Overall R-squared | | | | | 0.0027 | | | | 0.0046 | | | |
| F test (prob>F) | 0.0018 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 21A**: Regression of number of hospital beds per 10,000 people for Russia in 2000-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| Log of real GRP per capita | 0.0746 | *** | 0.0160 | 4.6700 | -0.1080 | | 0.0108 | -10.0400 | -0.0986 | *** | 0.0109 | -9.0600 |
| Log of real Gov.spending per capita | 0.0208 | | 0.0172 | 1.2100 | -0.0117 | *** | 0.0073 | -1.6000 | -0.0119 | | 0.0074 | -1.6000 |
| Constant | 3.8698 | *** | 0.1317 | 29.3800 | 5.9645 | *** | 0.0802 | 74.4000 | 5.8676 | *** | 0.0839 | 69.9200 |
| Number of observations | 693 | | | | 693 | | | | 693 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.0754 | | | | | | | | | | | |
| Within R-squared | | | | | 0.2947 | | | | 0.2947 | | | |
| Between R-squared | | | | | 0.1270 | | | | 0.1285 | | | |
| Overall R-squared | | | | | 0.0545 | | | | 0.0551 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 22A**: Regression of number of doctors per 10,000 people for Russia in 2000-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| Log of real GRP per capita | 0.1614 | *** | 0.0174 | 9.2600 | 0.0702 | *** | 0.0055 | 12.8600 | 0.0714 | *** | 0.0054 | 13.1000 |
| Log of real Gov.spending per capita | -0.0030 | | 0.0162 | -0.1800 | 0.0032 | | 0.0037 | 0.8700 | 0.0029 | | 0.0037 | 0.7900 |
| Constant | 2.1549 | *** | 0.1339 | 16.0900 | 3.0469 | *** | 0.0407 | 74.9500 | 3.0380 | *** | 0.0471 | 64.5300 |
| Number of observations | 693 | | | | 693 | | | | 693 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.1829 | | | | | | | | | | | |
| Within R-squared | | | | | 0.3762 | | | | 0.3762 | | | |
| Between R-squared | | | | | 0.1967 | | | | 0.1967 | | | |
| Overall R-squared | | | | | 0.1848 | | | | 0.1849 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.

**Table 23A**: Regression of number of new diseases diagnosed per 10,000 people for Russia in 2000-2008

| | Pooled OLS | | | | Fixed Effect (FE) | | | | Random Effect (RE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | | Std.error | t-value | Coef. | | Std.error | t-value | Coef. | | Std.error | z-value |
| Log of real GRP per capita | 0.1211 | *** | 0.01493 | 8.1100 | 0.0459 | *** | 0.0109 | 4.2200 | 0.0514 | *** | 0.0106 | 4.8400 |
| Log of real Gov.spending per capita | 0.01716 | *** | 0.0139 | 1.2300 | 0.0221 | *** | 0.0074 | 3.0000 | 0.0207 | *** | 0.0073 | 2.8500 |
| Constant | 5.2043 | *** | 0.1147 | 45.3900 | 5.9416 | *** | 0.0810 | 73.3300 | 5.8976 | *** | 0.0816 | 72.2800 |
| Number of observations | 693 | | | | 693 | | | | 693 | | | |
| Number of groups | | | | | 77 | | | | 77 | | | |
| Adjusted R-squared | 0.1784 | | | | | | | | | | | |
| Within R-squared | | | | | 0.1291 | | | | 0.1290 | | | |
| Between R-squared | | | | | 0.1978 | | | | 0.1991 | | | |
| Overall R-squared | | | | | 0.1755 | | | | 0.1773 | | | |
| F test (prob>F) | 0.0000 | | | | 0.0000 | | | | | | | |
| Breusch & Pagan test (prob>chi2) | | | | | | | | | 0.0000 | | | |

Notes: *** is significant at 1% level; ** is significant at 5% level; * is significant at 10% level.
Source: Author's estimation.